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Cerebral Vascular Accident Confounded by Parkinson's Disease: A Case Report

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CEREBRAL VASCULAR ACCIDENT CONFOUNDED BY PARKINSON'S DISEASE: A CASE REPORT

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ABSTRACT

BACKGROUND AND PURPOSE: There is a plethora of research pertaining to the treatment of cerebral vascular accidents or Parkinson's disease, but there is limited research about the treatment of these conditions in combination, especially during a short-term hospitalization. The purpose of this case report is to describe the physical therapy intervention and outcome for a patient post cerebral vascular accident with pre-existing Parkinson's disease during a short-term hospital stay.

CASE DESCRIPTION: The patient was a 76-year-old Caucasian male hospitalized after a possible mild cerebral vascular accident. The patient also had Parkinson's disease that limited his functional mobility and his ability to perform activities of daily living prior to his hospitalization. His Parkinson's symptoms were exacerbated during his initial admission to the hospital.

INTERVENTION: Gait training and lower extremity strengthening were the primary interventions utilized to address the functional mobility and activities of daily living deficits. As the patient improved interventions were progressed by increasing the difficulty and decreasing assistance during his three physical therapy treatment sessions.

OUTCOMES: During the patient's three-day acute care stay he improved his Five Time-Sit-to-Stand score by 24 seconds and his ambulation distance from 10 feet to 300 feet. The patient was discharged to a skilled nursing facility for a short-term stay to continue work on gait and lower extremity strengthening prior to returning home.

DISCUSSION: Parkinson's disease in combination with a possible cerebral vascular accident led to the patient's functional impairments and activity limitations. The

outcomes of this case report support previous research that has demonstrated intensive gait training and lower extremity strengthening may contribute to return to functional mobility and activities of daily living during a short-term hospital stay, however further research is needed to establish intervention effects in the greater population. As demonstrated in previous studies, this case report also supports the use of external feedback in combination with lower extremity strengthening to improve sit to stand transfers and ambulation ability. Recommendations for further research include studying the carryover of short-term functional training for patients with Parkinson's disease.

RESEARCH ADVISOR FINAL APPROVAL FORM

The undersigned certify that they have read, and recommended approval of the research project entitled…

Cerebral Vascular Accident Confounded by Parkinson's Disease: a Case Report

Submitted by
Jacqueline Moseman

in partial fulfillment of the requirements for the Doctor of Physical Therapy Program

Primary Advisor Debra Sellheim, PT, PhD Date 2/16/2015

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INTRODUCTION

Parkinson's disease is a progressive neurodegenerative disorder that primarily affects a person's mobility and activities of daily living.[1] Parkinson's disease is caused by the breakdown of neurons in the brain that produce dopamine. A decrease in dopamine can lead to the symptoms of Parkinson's disease, which include rigidity, tremors, bradykinesia, speech and writing changes, and impaired postural stability.[2]

Parkinson's disease is ranked just below Alzheimer's disease as the most prevalent neurodegenerative disease in the United States.[3] Parkinson's disease typically manifests itself in individuals over the age of 65.[4] In a study by Kowal et al[3] it was estimated that in 2010, 630,000 people in the United states had a diagnosis of Parkinson's disease[3]. It is estimated that the prevalence is 0.1% for people under age 45 and 1.3% for people 65 and older in the United States.[3] People with Parkinson's typically have difficulty moving from sit to stand, which has been linked to an increased risk for falls and loss of function due to decreased lower extremity strength.[5,6] A loss of muscle power, the ability to produce strength quickly, is also associated with the effects of Parkinson's especially in the lower extremities.[6]

Parkinson's disease has recently been linked to an increased risk for an ischemic cerebral vascular accident (CVA). A study by Huang et al[7] investigated the prevalence of CVA after a Parkinson's diagnosis. The study found the prevalence of an ischemic CVA was three times greater in patients with Parkinson's disease than patients without Parkinson's disease. It is speculated that because oxidative stress plays a role in both Parkinson's and ischemic CVA, a patient with Parkinson's disease is at greater CVA risk

due to the already increased oxidative stress degenerating the dopamine cells within the brain. Oxidative stress occurs when there is an imbalance between free radical and antioxidant defense production. When the antioxidants do not keep up with the free radicals oxidative damage occurs, which impacts the aging process. Oxidative stress can also contribute to an increase in atherosclerosis due to endothelial dysfunction, which leads to an increased risk for ischemic CVA or other cardiovascular events. Diabetes and hypertension also contribute to a higher risk of ischemic stroke in people with Parkinson's disease due to the increased oxidative stress levels from the Parkinson's as well as the diabetes and hypertension. Orthostatic hypotension can also be a part of the Parkinson's disease process, with about 30% of people with Parkinson's having orthostatic hypotension, which has been linked to an increased risk for ischemic stroke.[7] Individuals with Parkinson's disease and one or more of these comorbidities are at an increased risk for ischemic stroke.

Parkinson's disease and CVA are similar in their physical therapy management. Both pathologies typically have strength and gait deficits, so physical therapy tends to be focused on gait training and strengthening for transfers and improved gait performance.[1,8,11,12,13] In the Ottawa panel for post-stroke rehabilitation guidelines,[8] gait training and lower extremity strengthening were found to be effective, especially in improving activity of daily living within one month of training. Gait and progressive resistance training have been found to primarily benefit the functional status of a patient post-stroke.[8]

A study by Bhatt et al,[9] looked at the training effects of sit to stand transfers in people with Parkinson's disease and found that external feedback, such as auditory or visual cueing, is more effective than internal feedback due to the degeneration of the basal ganglia, which is needed for processing internal feedback. They also found that gait speed improved with external feedback as demonstrated by an increased step length and velocity during the treatment session.[9] Similar outcomes were found in a study of patients with Parkinson's disease by Muller et al[10] when gait and posture training were used to improve gait accuracy and amplitude. The subjects were able to ambulate ten meters using a decreased number of steps during the gait analysis after a gait training physical therapy session. After a manual cranial osteopathy technique the patients demonstrated an increased stride length along with increased cadence and velocity.[10]

In a systematic review by Lima et al,[11] it was found that progressive resistance exercise for people with mild to moderate Parkinson's disease can be effective if the training requires repetitive progressive muscle contractions. They also found that the resistance training does not carry over to all areas of function rather resistance training improved ambulation ability and capacity with decreased sit-to-stand time. These findings demonstrated that increased strength correlated with improved gait, stair climbing, and Timed Up and Go Test scores.[11]

In a Cochrane Review by Tomlinson et al[1] looking at the effectiveness of physical therapy for Parkinson's disease, it was found that physical therapy improved gait speed, endurance, and freezing of gait for up to three months after physical therapy was discontinued. The review was inclusive of all types of physical therapy, including

exercise, treadmill training, and cueing for gait. Dance and martial arts were also included under types of physical therapy for Parkinson's disease, but were not provided by a physical therapist. The review also highlighted gains in mobility and balance with physical therapy as demonstrated by improved scores for the Timed Up and Go, the Functional Reach, and the Berg Balance tests.[1]

A study by Ransmayr et al,[12] looked at non-pharmacological methods for patients with Parkinson's to improve mobility, activities of daily living, and quality of life. The investigators found that strength training, which included endurance, trunk control, and gait amplitude and rhythmicity improved balance and mobility. Additionally, lower extremity strengthening, range of motion, joint mobility, gait, and posture training were effective in improving strength, balance, gait speed, axial motor parameters, and physical functioning in patients with Parkinson's.[12]

In a randomized control trial by Paasuke et al,[13] hip and knee extensor strength was connected to length of time to rise from a chair. The study found that patients with Parkinson's had decreased bilateral isometric leg extensor strength, which is necessary for sit-to-stand transfers. In comparison to the elderly control population, patients with Parkinson's had a 24% longer chair rise time. The study also found that in general people with Parkinson's tend to participate in less physical activity than the elderly control population. Decreased leg extensor strength may be causing the decrease in physical activity or the decreased physical activity may cause a decline in leg extensor strength. The decreased sit-to-stand time for people with Parkinson's puts them at a higher risk for falls.[13]

In summary, gait training and lower extremity strengthening have demonstrated effectiveness in decreasing the functional limitations of Parkinson's disease. The purpose of this case report was to describe the physical therapy rationale of balance, gait, and lower extremity strength training for an elderly male with Parkinson's disease and a possible mild ischemic CVA in an acute care setting. The patient gave written informed consent to be the subject of this case report, see appendix A.

CASE DESCRIPTION

Patient History

The patient was a 76-year-old Caucasian male who was admitted to the hospital with confusion, slurred speech, and imbalance due to a possible CVA. On the patient's last day in the hospital it was confirmed by MRI that he had sustained a small left parietal lobe CVA. Throughout this paper, however the CVA will be referred to as a potential diagnosis because all of the physical therapy treatment took place without a confirmed diagnosis.

According to the patient and the electronic medical record, prior to the hospitalization, the patient was living at home with his wife. The patient was a community-dwelling older adult who was independent in all activities of daily living and did not use an assistive device for ambulation. The patient's wife reported that the patient had tremors and a shuffling gait prior to hospitalization. The patient lived with his wife in a single level home with three steps to enter. The patient's past medical history included: Parkinson's disease, a craniotomy for brain tumor resection with cranial nerve seven palsy, left sided hearing loss, type-II diabetes, hypertension, hyperlipidemia,

and obstructive sleep apnea. The patient was diagnosed with Parkinson's disease about a year prior to his hospitalization and was started on Carbidopa –Levadopa to help with his tremors about a month prior to the hospitalization. At the time of the physical therapy evaluation, the patient was in good spirits and was medically stable. The patient had no formal physical therapy for Parkinson's prior to hospitalization.

The patient was referred to physical therapy from the hospital neurologist due to symptoms of a potential CVA and Parkinson's disease. The patient had a good understanding of his pathologies and was motivated and in good spirits throughout his entire hospitalization. The patient and his wife were not aware of possible intervention options for Parkinson's such as the Lee Silverman Voice Treatment Big and Loud Program.[14] Information was given to the patient about different intervention options to help slow or decrease the decline of function due to Parkinson's disease. The patient's main goal during his acute care stay was returning home with his wife, which required the patient to be able to ambulate safely with an assistive device, perform stairs independently with a front-wheeled walker (FWW), transfer sit to stand with no more than minimal assistance, and demonstrate safe bed mobility with the need for minimal assistance or less.

Systems Review and Examination

Pain, Skin, Sensation, Cognition

The patient had no complaints of pain throughout the evaluation and no formal testing of pain was used throughout the physical therapy sessions. Skin was intact throughout the patient's body and there was no evidence of skin irritation from the

hospital bed. Sensation was also grossly intact for all four extremities. During the evaluation, the patient was alert and oriented to person, place, and time once he was sitting up in bed. The patient was mildly confused when lying supine in bed.

Range of Motion and Strength

Range of motion (ROM) and strength were screened, but not formally tested due to patient fatigue and bouts of confusion and impulsivity. The patient's upper and lower extremity ROM was within functional limits for bed mobility, transfers, and ambulation. The patient did lack approximately 10 degrees of hamstring length bilaterally with seated long arc quad sets. The patient demonstrated symmetrical strength for bilateral lower extremities with antigravity leg control exercises. Leg control exercises included ankle pumps, heel slides, hip abduction, gluteus sets, and quad sets. The patient also demonstrated functional lower extremity strength with standing and ambulation in the room with a FWW and moderate manual assistance and verbal cueing. The patient's upper extremity strength was not formally tested but the patient demonstrated adequate upper extremity strength for functional mobility.

Balance

The patient demonstrated poor balance with standing activities, but had adequate sitting balance. The patient performed sitting functional reach bilaterally and was able to reach greater than 10 inches with appropriate equilibrium reactions. The patient was able to independently balance sitting on the edge of a bed but required assistance while donning socks. The patient was able to lift each foot for the therapist to don his socks.

When standing, the patient leaned backwards and rested his legs on the bed for support. The patient required a two-wheeled walker for balance when standing independently and sidestepping next to the bed. The patient completed a modified Five Time Sit to Stand Balance Assessment[15, 16] and scored 47 seconds. This test was used to further assess the patient's lower extremity strength and endurance, along with his ability to balance during transitional movements. The Five Time Sit to Stand requires the subject to stand up and sit down from an armchair of normal height (18inches) five times as quickly as he/she can without using the upper extremities for assistance. Normative data for ages 70-79 is 10 seconds to complete the test, with a standard deviation of 3.1 seconds.[15,16] This test demonstrated that the patient is at a high risk for falls with a score of 47 seconds and an inability to perform the test without the use of his upper extremities. Inter-rater reliability is 0.99 and intra-rater reliability for the older population is 0.92.[17] The minimal detectable change for older adults is 3.12 seconds.[18]

Functional Mobility

The patient was able to ambulate in the hospital room 10 feet forward and 10 feet backwards with a two-wheeled walker with moderate manual assistance of one and verbal cueing. The patient demonstrated a protective extension mechanism for the right lower extremity with standing marching exercises. To test balance and lower extremity strength, the patient performed 10 repetitions of standing marching exercises in a FWW. The patient required maximum assistance to move from supine to sit and minimum assistance with sit to supine in bed. Transferring sit to stand required the moderate assistance of one and a two-wheeled walker was needed for balance when standing. The

patient also demonstrated impulsivity with movement, decreasing his safety and increasing his risk for falls.

Evaluation/Diagnosis

The initial examination confirmed that the patient had limited mobility due to a possible CVA and Parkinson's disease. According to the *Guide to Physical Therapist Practice 3.0*[19] the patient demonstrated the body function and structure impairments of decreased standing balance, safety awareness, and lower extremity strength causing him to be at an increased risk for falls. The patient's activity limitations included decreased ability to perform transfers, ambulation, and stairs.[19]

The specific goals outlined for the patient and his wife to return home included the patient being able to ambulate 50 feet with minimal assistance using a FWW and to transfer supine to sit and sit to stand without physical assistance. An additional goal to decrease the patient's fall risk and increase functional mobility at home was for the patient to be able to perform the Five Time Sit to Stand Test in 30 seconds or less.

Prognosis

The patient's prognosis with short-term physical therapy for balance, lower extremity strengthening, gait and transfer training was fair due to the short timeframe of acute hospital stays and the severity of the patient's condition. Although the patient and his wife were very motivated and held positive attitudes towards improving the patient's function in order to get back home, the patient had several deficits to overcome. According to the patient's level of dependence during the physical therapy evaluation it was expected that the patient would need to spend time in a transitional care unit prior to

returning home. In the long term it was expected that the patient would be safe and require minimum assist or less for functional mobility in order to return home with his wife.

Intervention

The patient participated in a total of three treatment sessions prior to discharge to a skilled nursing facility for a short-term rehabilitation stay before returning home with his wife. Each treatment session included lower extremity strengthening, balance activities, gait training, and transfer training. These interventions were chosen to promote functional independence in order to help the patient reach his goal of going home as soon as possible. The original plan was to see the patient two times a day for two to three days but the patient was discharged on the second day of treatment sessions because he was medically stable. Although the patient had made great progress by this time, he needed a skilled nursing facility placement in order to gain functional independence and be safe at home with his wife. The specific physical therapy interventions including duration and frequency are reported in Table 1. Due to the patient's strong motivation to attain functional independence and return home, he needed to be held back a little on his last day due to fatigue from working so hard with speech, occupational, and physical therapies.

Verbal cueing was primarily used during gait training in order to suspend the patient's shuffling gait pattern. Verbal cues included taking big steps, standing up tall, and heel strike at initial contact. The patient was successful in changing his gait pattern during the immediate treatment session but there was little carryover to the next session.

The patient needed reminders at the beginning of each treatment session to pick up his feet and not shuffle. Verbal cueing was used because of its demonstrated effectiveness in patients with Parkinson's disease.[9]

Table 1. Interventions

Interventions	Session 1 (AM)	Session 2 (PM)	Session 3 (AM)
Ambulation (CGA & FWW)	300ft Verbal cues for big steps and to stay inside walker	300ft	300ft Verbal cueing for heel strike on left foot
Sit to Stand (Bed height raised)	2 sets of 5 and 1 set of 10	2 sets of 10	3 sets of 10 and 2 sets of 5 Arms across chest
Standing Leg Extension (FWW)	20 repetitions	20 repetitions	20 repetitions
Forward/Back Ambulation	10ft, 1 repetition with FWW and 2 repetitions without FWW	5ft, 5 repetitions no FWW, sitting between each repetition to practice sit to stand transfers	10ft, 4 repetitions, no FWW
Standing Leg Control Exercises * (FWW)	20 repetitions	10 repetitions Verbal cues for high knees	5 toe raises only due to patient fatigue
Transfer (sit↔stand)	Min Assist	CGA	CGA
Bed Mobility	CGA	CGA	CGA

* Leg Control Exercises: marching, toe raises, heel raises, forward/back toe taps

OUTCOMES

Gait speed and the Five Time Sit to Stand test were the primary outcome measures used to quantify the patient's progress (Table 2). Gait speed was not recorded during the evaluation because the patient was only able to ambulate ten feet in his room with moderate assist of one due to telemetry monitoring. During the patient's first

treatment session he was able to ambulate farther than expected so the gait speed test was initiated during the second treatment session after he demonstrated the ability to ambulate safely with a FWW for 300 feet. The patient was then timed each session for 300 feet, from the time he stood up from the bed until he sat back down. The patient's gait speed was only recorded twice and there was a decrease in his gait speed during his last physical therapy session due to fatigue from working so intensively with physical, occupational, and speech therapy each day. The recorded time was converted to meter/second in order to correlate gait speed with falls risk. Normal ambulation speed for healthy community dwelling older adults is between 0.9 -1.3 m/s.[20] The Intraclass Correlation Coefficient (ICC) for the gait speed test is 0.96 and the minimal detectable change is 0.16m/s.[18,21]

The patient improved substantially on the Five Time Sit to Stand test however, he was very fatigued on his last morning session. Normative data for the Five Time Sit to Stand is 10 seconds for adults age 70-79.[16] The patient continued to be at high risk for falls, with a score at least double the normative data at the time of his discharge. This finding dictated his need for a skilled nursing facility placement prior to returning home.[16] The patient was discharged from the hospital due to his stable medical condition and a plan for physical therapy continuation at a skilled nursing facility. Prior to discharge, the patient had met all plan of care goals except being able to perform stairs independently with a FWW. Stair usage was not tested with the patient before discharge since he was going to a skilled nursing facility to continue therapy.

Table 2. Outcomes

Outcome Measures	Normative Data	Initial Evaluation	Session 1	Session 2	Session 3
Gait Speed	0.9-1.3m/s			0.667m/s	0.630m/s
5 Time Sit to Stand	10 seconds	47 seconds	24 seconds	23 seconds	27 seconds

Discussion

Parkinson's disease can be very debilitating due to its progressive neurodegenerative process. Physical therapy can contribute to slowing the loss of function for people with Parkinson's, but cannot stop the progression.[1] This case report looked at lower extremity strengthening, sit-to-stand training, and gait training effectiveness for an elderly patient with Parkinson's disease and a possible mild CVA in an acute care setting.

During the patient's hospitalization he was able to make significant gains in his functional mobility. The outcomes of this case report support previous research demonstrating an improvement in sit-to-stand transfers and gait capacity with verbal cueing and lower extremity strengthening.[1,9-12] In a systematic review by Lima et al[11], progressive resistance training was found to be effective in improving ambulation endurance in both short and long term intervention protocols. Gait training with external auditory or visual feedback has been shown to be effective for people with Parkinson's disease by helping to improve ambulation capacity and efficiency affected by the degeneration of the basal ganglia, which processes internal feedback.[10] In a study by Muller et al[10], subjects demonstrated improvement in gait by requiring fewer steps to

ambulate 10 meters after only two sessions of gait training with external feedback from a physical therapist.[10] Similarly, the patient in this case report, was able to ambulate a greater distance from the evaluation to the first treatment session when external feedback was initiated and was able to maintain changes in his gait to decrease shuffling during each treatment session. The patient was not able to maintain a gait pattern without shuffling between sessions but he was able to carryover the increased distance he was able to ambulate.

In this case report, the patient demonstrated rapid improvements in both gait and sit-to-stand transfers, which also supports previous research findings. Sohmiya et al[22] studied the short-term effects of physical therapy on subjects with Parkinson's after one 30-minute session. The subjects were placed in one of two groups based on their functional assessment battery score. The patients with higher scores and less severe Parkinson's demonstrated improvements in gait and joint range of motion immediately after one 30 minute physical therapy session. The gait improvements included increased stride length, step length, and ambulation speed. There was also an increase in hip and knee joint range of motion after gait training with external auditory cueing, balance training, and stretching of the trunk and lower extremities. Motor learning may be the main contributing factor to the immediate improvement in gait deficits.[22] Motor learning ability declines in people with Parkinson's disease due to the degeneration of the basal ganglia, which makes them more dependent on environmental cues for motor tasks. In the study by Sohmiya et al[22] auditory and visual cueing were used as environmental cues, and immediate improvements in gait were demonstrated.

In a study by Peurala et al[23] 22 patients within 10 days post-stroke participated in an intensive gait-training program for three weeks. These patients were given an hour each day to get in 20 minutes of gait training either over ground or with an electromechanical gait trainer. The patients' demonstrated improvements in the 10-meter walk test and the amount of manual assistance required to ambulate over ground. The patients were also able to increase speed on the gait trainer and decrease the amount of body weight support required within the three weeks. The participants were able to tolerate the intensive gait training well and the task specific training allowed the patients to make large improvements in their ambulation ability, which was maintained at the six month follow up.[23] The patient outcomes described in this case report contribute to the existing research by demonstrating similar improvements in ambulation ability and required manual assist, as well as increased gait speed and distance.

It is not possible to demonstrate a causal relationship between interventions and outcomes based on a single case report. Other factors may have contributed to this patient's success in physical therapy including his motivation and social support, as well as the early resolution of the effects of a possible mini CVA by the second day of physical therapy. Additionally, the severity of the patient's Parkinson's disease was never quantified, so it was difficult to compare the patient with existing evidence, most of which is based on Parkinson's severity.[1,11]

A limitation of this case report was the inconsistent use of the outcome measures. The gait speed outcome measure was not implemented until the second day of treatment, which made it difficult to determine accurate improvement in gait speed over the three-

day period. The Five Time Sit to Stand test was modified in order for the patient to be successful, so the results cannot be directly compared to the standardized norms for this outcome measure. Another limitation was the lack of an accurate CVA diagnosis, which was not determined until the day of the patient's discharge from the hospital. The patient had MRI's and CT scans daily to determine his CVA status however the results were inconclusive until his last MRI on the morning of his discharge, where a small left parietal lobe CVA was depicted. Finally, the number of physical therapy treatment sessions was limited to three due to discharge of the patient from the hospital to a short-term rehabilitation center.

Future research on the carryover of the short-term effects of functional training for people with Parkinson's disease would be helpful in determining the most effective interventions for short-term functional training and what a patient is able to carryover to the next step in the continuum of care. Also, further investigation of the link between Parkinson's disease and ischemic CVA has the potential to influence the prevention of ischemic CVA in people with Parkinson's disease. There is ample research on long-term intervention effectiveness and multi-modal physical therapy, but the effects of short-term acute care physical therapy for Parkinson's disease is lacking.

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Appendix A

Case Report Information and Consent Form

Introduction:
You are invited to be the subject of a case report assignment to be written by _____, Doctor of Physical Therapy graduate student from St. Catherine University, under the supervision of Debra Sellheim, PT, PhD, Doctor of Physical Therapy program faculty member, and _____, the student's clinical instructor/s. You were selected as a possible subject for this case report assignment because your course of physical therapy care would be of interest to physical therapist students and physical therapists. Please read this form and ask questions before you agree to be the subject of this case report.

Background Information:
The purpose of this case report assignment is to describe the physical therapy care you are receiving and how you respond to the care you are receiving at _____ (name and address of facility).

For example, the case report assignment would describe the following:

1. why you are receiving physical therapy at this time;
2. the kinds of physical therapy treatment/s you are receiving at this time;
3. the effectiveness of the physical therapy treatment for you at this time.

This case report assignment will help others better understand how physical therapy may help other people like you.

Procedures:
Your decision about participation will not affect your physical therapy care in any way. If you decide to participate, your physical therapy care will proceed just as it would if you were to decide not to participate. If you decide to participate, you may choose whether or not you will allow the following:

1. whether your photograph can be taken and used in public presentation of this case report assignment (if applicable; student will inform you);
2. whether what you say can be quoted directly in the case report assignment.

The case report assignment will be read by DPT faculty members. This case report assignment may be read by the physical therapist/s supervising the student at this facility. The case report assignment will be presented to other students and faculty at the St Catherine University Doctor of Physical Therapy Program. The case report assignment may also be presented at a professional meeting locally or nationally.

Risks and Benefits:
There are no risks or benefits to you for participating in this case report assignment.

Confidentiality:
Any information obtained in connection with this case report assignment that could identify you will be disclosed only with your permission. Your name, or names of your family members, will not be used in any way in the case report.

Voluntary nature of this case report:
Participation in this case report assignment is voluntary. Your decision whether or not to participate will not affect your future relations with St Catherine University, or with the facility at which you are receiving physical therapy. If you decide to participate, you are free to discontinue participation at any time without affecting these relationships.

Contacts and questions:
You are encouraged to ask the student or the physical therapist supervising the student any questions about this case report assignment, at any time. You may also contact Debra Sellheim, DPT Program Faculty, if you have questions at any time (see contact information below). You may keep a copy of this consent form for your records.

Statement of Consent:
You are making a decision whether or not to participate in this case report assignment. Your signature indicates that you have read this information and your questions have been answered. Even after signing this form, please know that you may discontinue your participation in this case report assignment, at any time.

I agree to participate in this case report assignment. Yes ___ No___

I agree to being quoted directly in this case report assignment. Yes____ No____

I agree to being photographed and having the photographs included in the public presentation and/or publication of this case report assignment. Yes ___ No___ NA___

_____
Signature of subject Date

_____
DPT student's signature Date

Faculty member supervising the student:

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