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Abstract

Individuals who experience a spinal cord injury (SCI) often have difficulty completing occupations of daily living and returning to their previous roles and leisure occupations. This case study used a PNF approach to completing occupations. These techniques and patterns of movement were implemented on dry land first, and then became water-based interventions. The model of human occupation was also utilized to maintain a client-centered approach to therapy and ensure that the occupations that the PNF techniques were utilized during would be meaningful to the client. The Worker Role Interview (Velozo, Kielhofner, & Fisher, 1998), Self Assessment of Occupational Functioning (Baron & Curtin, 1990), and the Occupational Performance History Interview (version 2.0) (Kielhofner, Mallinson, Crawford, Nowak, Rigby, et al., 1998) were completed by the client after he was discharged from inpatient rehabilitation. These evaluations were utilized to assess the client’s readiness to return to work, and various concepts important to MOHO theory and application. Results of the evaluations indicated that the client scored poorly in areas of functioning such as leisure and social participation. Based on those results and assessment of the client’s hobbies and interests, water-based interventions utilizing PNF techniques at the local YMCA were planned and implemented with the client, and included his wife and two young children. The overall results of the case study were significant improvements in functional ability, successful return to previous roles, increased self awareness, and increased social and leisure participation.
Introduction

The client is a 37-year-old Caucasian male who was transferred to Bayfront Medical Center from St. Petersburg General Hospital on December 25, 2009 with complaints of back pain and neurological deficits of the lower extremities. The client reported that the back pain had been persistent three weeks and that he could no longer ambulate. The client reported that he could not move his right leg, and had full numbness of his left leg, requiring him to utilize crutches and the assistance of two people to ambulate. The client also complained of feeling too weak to expel bowels and having painless muscle spasms from his chest area down which would last a few seconds and then resolve. An MRI of the thoracic spine revealed an intradural-extramedullary mass on the right side of the thoracic spinal cord at the T4 level. This mass caused severe central cord narrowing and compression of the thoracic cord. The client underwent a T3-T5 thoracic laminectomy and resection of the tumor on December 26, 2009. The client was then admitted to inpatient rehabilitation on December 29, 2009 with the diagnosis of T4 paraplegic, ASIA-C, secondary to extramedullary mass.

Past medical history includes: childhood asthma, mitral valve prolapsed, obesity, borderline hypercholesterolemia, history of constipation, and insomnia which is treated with melatonin. Past surgical history includes an appendectomy and tonsillectomy. The client is married. He has two daughters, a three and seven year-old. The client currently works in information technology at St. Petersburg College. The client received a medical leave of absence from his employer upon hospitalization, and returned to work on April 12, 2010 after ongoing communications with the Human Resources department.

The Proprioceptive Neuromuscular Facilitation approach (Meyers, 1995) was utilized with the client due to the nature of his diagnosis. PNF is used mostly with individuals with
damage to the central nervous system (CNS) because it interferes with sensory/perceptual inputs and motor control. As summarized by Adler, Beckers, and Buck (2008), there are certain principles that are basic to PNF. These principles include: maintaining an integrated approach where each treatment is directed at the total human being, not just the problem area; the therapist focuses on un-tapping existing potential of all clients; the treatment approach is always positive, focusing on what the client can do physically and psychologically; achievement of the highest level of function is the primary goal of treatment; and integration of motor control and motor learning, including treatment of body structures, activity levels, and participation. Proper facilitation of PNF concepts include basic procedures, such as: resistance, irradiation and reinforcement, manual contact, body position and body mechanics, verbal commands, vision, traction and approximation, stretch, timing, and patterns of movement (Adler, Beckers, & Buck, 2008). As summarized in Ogden (2002), PNF patterns are named in reference to the movement in the joint closest to the trunk and the end position of the pattern. There are D1 and D2 patterns for the upper and the lower extremities. Each pattern has a major component consists of internal or external rotation, flexion or extension, abduction or adduction.

The D1 upper extremity pattern includes internal rotation of the shoulder, abduct and extend the shoulder slightly behind the body, with the hand opened wide. Then, externally rotate the shoulder while adducting and flexing it across midline, making a fist to come to the opposite ear. This is called D1 flexion (Voss, Ionta, & Myers, 1985). Reversing the pattern is D1 extension. These movements should be repeated several times, each time including the rotational component. When the client is practicing these patterns, he or she should allow his or her eyes to follow the hand in each direction, which could cause cervical rotation with flexion or extension, depending on the pattern. (Voss, Ionta, & Myers, 1985).
The lower extremity D1 pattern is completed by internally rotating the hip, abducting and extending it slightly behind the body. The foot is in plantar-flexion with the sole of the foot everted. Then, externally rotate the hip, while adducting and flexing it up and across your body (Voss, Ionta, & Myers, 1985). This results in having the ankle dorsi-flexed and the sole of the foot inverted. This is the D1 flexion pattern, with D1 extension being the reverse of this pattern.

To accomplish the D2 upper extremity pattern, the client needs to internally rotate the shoulder, then adduct and extend the shoulder with the hand in a hitchhike fist. Touch the thumb just above the opposing hip. Next, externally rotate the shoulder to the same upper side of the body, opening the hand while abducting the shoulder. This is called the D2 flexion pattern, resulting in both arms up in the air in a “V” pattern. The reverse the pattern is D2 extension.

These patterns can be completed bilateral symmetrical, meaning that each arm is doing the extension pattern and then the flexion pattern at the same time (Voss, Ionta, & Myers, 1985). Completing the patterns in a bilateral reciprocal manner means that one arm is doing the flexion pattern while the other arm is doing the extension pattern.

The D2 lower extremity pattern is accomplished by externally rotating the hip, adducting across midline and extending it behind the body. The foot is in plantar-flexion and the sole is inverted (just as if you were to curtsy). Then, internally rotate the hip, abduct and flex it to the upper side of the body. The foot is dorsi-flexed and everted. This is D2 flexion with the reverse being D2 extension.

The techniques from this approach were utilized with the patient to increase strength and decrease extension tone in his lower extremities. These techniques are necessary to accomplish in order to increase the client’s independence in lower extremity dressing, commode/tub transfers, and functional ambulation. The following techniques were integrated into therapeutic
interventions with the client: physical contact by the occupational therapist and occupational therapy student; visual cues; verbal commands and instructions for movement; using stronger muscle groups to stimulate activity of weaker groups (irradiation); using voluntary motion to inhibit reflexes (innervations); appropriate positioning; and stretching muscles. Since the client’s upper extremities were within normal limits, the upper extremity common diagonal patterns were only the main focus during the initiation of treatment, and when working on balance and core strengthening during reaching activities and Wii therapy. These techniques were also utilized, with the addition of providing resistance, during aquatic follow-up visits by the occupational therapy student which are described later in the Outcomes section.

A quantitative study by Munih, Obreza, Sega, et al. (2004) compared the use of proprioceptive neuromuscular facilitation (PNF) exercises to the use of lower extremity functional electrical stimulation (FES), voluntary movement, and combination of PNF and FES techniques. The study examined two participants who had incomplete spinal cord injuries. Each participant was monitored for a one-month period, with range of motion measurements taken at the hip, knee, and ankle at the end of each session. The following PNF pattern was utilized in this study: flexion, adduction, and external rotation of the hip, knee flexion, and dorsiflexion with inversion of the ankle. The start position was the reverse of the above position, this was completed daily. The participants also received five consecutive trials that combined the PNF pattern with FES. Results of the study indicated that the participants had increased range of motion with PNF alone, but the greatest results were after the combination of FES with PNF patterns. Further studies need to be completed utilizing PNF with spinal cord injured patients, especially since a literature review yielded no studies of this nature within the field of occupational therapy.
The Model of Human Occupation (Kielhofner & Burke, 1980) was utilized with the client as well. The plan of care, including assessments and interventions, are based on the client-centered approach of the model of human occupation (MOHO). The theory-based interventions focused on the client’s volition, habituation, and performance capacity. The occupational therapist and occupational therapy student also provided resources and opportunities based on the client’s values, interests, personal causation, roles, habits, and performance capacity while evaluating the environmental impact. The Home Evaluation that the client completed also focused on the aforementioned concepts.

The individual chosen for the case study has been diagnosed with a non-traumatic spinal cord injury secondary to resection of a tumor, resulting in incomplete paraplegia. Of the reported 12,000 new cases per year, only 8.1% are non-traumatic injuries, and only 18.5% result in incomplete paraplegia (National SCI Statistical Center, 2008). The incidence of having a tumor in the spinal cord, causing a spinal cord injury is also rare (Park, Jang, Kang, Song, & Lee, 2007). In addition, typically these tumors (intradural-extramedullary mass) are detected by magnetic resonance imaging (MRI); however this client had been having extreme back pain for eight years and had not been ordered an MRI until this admission. This was the primary cause for the transfer from St. Petersburg General Hospital, as they do not have an MRI machine.

Even though the MOHO assessments were necessary to apply the model of practice to the treatment plan of the client, they are non-routine assessments at the inpatient rehabilitation unit of Bayfront Medical Center. This model was applied in order to provide theory-based practice, however site-specific assessments and evaluation forms are the only assessment standard in this setting. However, the worker role interview (Velozo, Kielhofner, & Fisher, 1998), the self assessment of occupational functioning (Baron & Curtin, 1990), and the occupational
performance history interview (version 2.0) (Kielhofner, Mallinson, Crawford, Nowak, Rigby, et al., 1998) were completed by the occupational therapy student in collaboration with the case study client.

During inpatient rehabilitation, the client received one on one care by the occupational therapy student, who was supervised by the occupational therapist. Typically in this setting, the occupational therapist may be treating two clients during the same treatment time. While in inpatient rehabilitation, the case study client also received extended therapy sessions, equaling approximately 11 extra therapy hours. This was made possible since the case study client was the primary client treated by the occupational therapy student and the supervising occupational therapist could maintain her case load during these extended treatment sessions. The client also participated in a variety of client-centered interventions, such as the cake decorating occupation (see Appendices A and B), and the use of Wii therapy while weight-bearing in the standing frame. The client’s wife and children were also taken into account during treatment planning. As a family, they enjoyed putting together puzzles and playing games, so when his family (mother, father, wife, and/or daughters) would come during the afternoon treatment sessions the family would get incorporated into the planned intervention. For example, the client participated in Wii therapy while in the standing frame, and played tennis, bowling, and boxing against his mother, father, and wife. The client also put together puzzles and played games with his wife and daughters while in the standing frame. This was particularly meaningful for the client because his daughters had been upset and were not sleeping very well (per client and spouse report) secondary to missing their father and seeing their father in his current medical state. However, his daughters would brighten up when they got to see their father standing, yet alone being able to participate in therapy. The occupational therapy student also facilitated play and family
interaction by allowing his children to select games and puzzles from the intervention room to play with their father back in his room. All borrowed materials were returned by the client the following day.

Another unique intervention was the use of the Bioness L300 as a co-treatment between the occupational therapy student and physical therapy. This client was the first in the county that qualified to utilize bilateral lower extremity units (per representative of St. Petersburg Limb and Brace). The use of FES to facilitate a normal gait pattern and decrease muscle atrophy has been researched, but have controversial findings. The goal of utilizing the Bioness L300 from an occupational therapy standpoint was to improve the client’s gait pattern, which would lead to improved functional ambulation for occupations of daily living (ODL) tasks. This was an important factor in order for the client to have increased independence once he had been discharged home. The client does not have a wheelchair accessible bathroom, and at the time of the home evaluation, the client required physical assistance of two therapists and heavy reliance on upper extremity involvement on the walker to ambulate to the toilet from the bathroom entrance (approximately 15 feet). So, by improving his gait pattern, it would improve his safety (decreased foot drop), and allow for the client to utilize the bathroom (toilet and shower).

Follow-up care was also unique, as the client would not have received this care if it were not provided by the occupational therapy student. The client and his wife communicated with the occupational therapy student via E-mail during the period of time that he was receiving outpatient occupational therapy. The occupational therapy student made follow up visits to the client’s home and his workplace. The occupational therapy student also completed water-based interventions with the client at the local YMCA. These follow-up visits are discussed in more detail in the Intervention and Outcomes section.
Psychosocial issues were also addressed with the client, specifically addressing his poor self concept. For example, the client did not want his daughters to see him in his wheelchair, so the occupational therapy student facilitated standing occupations during the time frame that his family would observe therapy. These occupations included the use of the Bioness L300 and the electric standing frame. Once discharged, the occupational therapy student focused on return to work for the client, as this has been found to have a big impact on quality of life, resulting in fewer depressive episodes (Lidal, Huynh, & Biering-Sorensen, 2007). This was done by completing preparatory exercises to simulate work occupations, and by completing one visit to his workplace prior to his return. Further work follow-up visits were also completed which are described in more detail later in this paper. Follow up visits also catered to the client’s self image as we focused on completing tasks in standing, and changed our outings and planned occupations (such as going to the beach) based on the clients increased anxiety about those situations. The water-based interventions also aided in improving the client’s self image as he felt like he looked “normal” while in the pool setting.

Evaluation of Client

The client is a 37 year-old, right handed male. The client has a diagnosis of T4 paraplegic, ASIA-C, secondary to extramedullary mass. History of the current illness includes episodes of back pain in the past occurring in his mid to lower back. Approximately eight years ago, the client had sharp, shock-like sensations and difficulty with movement, and once again three years ago had the same occurrence. Per client report, he had seen his primary physicians for these complaints and was treated with medicine.

The Inpatient Rehabilitation Occupational Therapy Initial Evaluation was completed on December 29, 2010. The client reported living in a one-story home with his wife and two
daughters. Prior to hospitalization, the client was driving, and working at SPC as an IT technician. Previous responsibilities at home included completion of finances, shopping, cooking, and housework. Pre-hospitalization the client was independent in dressing and bathing. The client reported the following pre-morbid hobbies and leisure activities: cooking, visiting friends and family, sports (football, swimming, and volleyball), listening to music, watching TV and movies, completing puzzles, playing board games, reading (technician manuals and scuba diving magazines), outdoors activities (bike rides, camping, and canoeing), video games, and making home improvements.

The client c/o numbness and tingling in his right lower extremity, and had impaired stereognosis in left lower extremity. However, localization and proprioception in bilateral lower extremities were within functional limits. Findings also indicated that the client’s bilateral upper extremity AROM were WNL, and bilateral UE strength was grossly 5/5 with the exception of the left shoulder with was 4/5 and right shoulder which was 4+/5. The client’s hand function was within normal limits, and no subluxation or edema was noted. The client did report having pain in his back during evaluation. The client’s UE coordination was within functional limits; however poor scapular mobility was noted. On December 30, 2010 Functional Independence Measure (FIM) scores were recorded, indicating the following functional levels: 5 for feeding, grooming, and UE dressing; 1 for LE dressing; and 0 for toilet transfers, tub/shower transfers, and homemaking.

A home evaluation was completed on February 8, 2010 as an occupational therapy and physical therapy co-treatment, and a Home Evaluation Form was filled out. The client’s wife and youngest daughter were present. The client was required to: propel himself up a portable ramp into the house; complete wheelchair transfers on/off his bed; complete wheelchair mobility in
kitchen, living room, and bedroom; functional ambulation with walker from hall to commode in bathroom requiring physical assistance x 2; and transfer from commode to/from shower bench. Several impressions were made after evaluation of the client’s performance during the home evaluation. The client will need maximum assistance to enter the bathroom with a rolling walker. He will also need assistance to get on/off commode in the bathroom and in/out of the tub utilizing the tub bench. The client will be independent wheelchair level in the bedroom, kitchen, and living room. The client will also need assistance to enter his home secondary to requiring a second person to move the portable ramp to the second step. It is recommended that the book case in the hallway be moved to allow more space to propel the wheelchair through the hallway and that the bathroom door be taken off its hinges. The client will require a ramp to enter the house, a rolling walker with wheels for inside the house (bathroom), a tub bench, a drop arm commode, and a slide board.

The Proprioceptive Neuromuscular Facilitation Patient Evaluation Form was completed with the case study client. The client’s hearing, breathing, swallowing, voice production, facial and tongue motions, and vision/ocular control were deemed to be within normal limits as these aspects were not affected by the spinal cord injury. The client’s head and neck are properly aligned at midline, and do not require more stability or mobility. All upper extremity PNF patterns were within normal limits during the initial evaluation. The client required verbal cues for rolling technique, and for getting into short sitting and long sitting. The client required physical assistance to get into quadruped, ant to sit on his heels. The client required lower extremity stabilization and physical assistance to mobilize the pelvis during anterior and posterior tilts when in quadruped. Deficient positions included hands-and-feet (arched position), standing, bridging, and ambulation. Deficient lower extremity patterns included variations and
combinations of the following motions against gravity: dorsiflexion and plantar flexion, hip flexion, knee flexion, hip abduction and adduction.

The following MOHO assessments were also completed with the case study client: the Worker Role Interview (Velozo, Kielhofner, & Fisher, 1998); the Self Assessment of Occupational Functioning (Baron & Curtin, 1990); and the Occupational Performance History Interview (version 2.0) (Kielhofner, Mallinson, Crawford, Nowak, Rigby, et al., 1998). Results of the Worker Role Interview (Velozo, Kielhofner, & Fisher, 1998) strongly supports return to work by the client. The client reported being very committed to work, and identifies himself with the worker role. The client could clearly identify his job expectations, and how his current abilities and limitations will interfere with work related tasks. The client reported having a very supportive boss and co-workers, and it is recommended that the client return to work upon discharge from outpatient occupational and physical therapy.

The Self Assessment of Occupational Functioning (Baron & Curtin, 1990) was completed by the client in his home after discharge from inpatient rehabilitation. Areas that the client indicated needing improvement include: being physically able to do what needs to be done; organizing my time; and having habits that support success in my roles. The client placed priority on improving his ability to organize time, and having habits that support success in my roles. The client was able to identify the following goals: “build up muscle in my hamstring;” and “better my balance and ability to walk.” His plan for action to address both of these stated goals was to complete more home therapy exercises, and to use the wheelchair less and the walker more often. After reviewing the assessment with the client, the occupational therapy student identified different ways the patient could complete the exercises, and incorporation of completing every day tasks as a substitution to rote exercise.
The Occupational Performance History Interview (version 2.0) (Kielhofner, Mallinson, Crawford, Nowak, Rigby, et al., 1998) was also completed at the client’s home after being discharged from inpatient rehabilitation. Results of the interview indicated that the client was exceptionally competent in the following areas of occupational functioning: found meaning and satisfaction in lifestyle (past); made occupational choices (past); fulfilled roles (past); maintained habits (past); and achieved satisfaction (past). The client indicated being extremely occupationally dysfunctional during: leisure occupational forms; and with leisure physical spaces, objects, and resources. The client made it clear during the interviewing process that his life was best prior to hospitalization, and as the results indicated, he stated that his life was at its worst in his current condition.

**Goal Setting**

While in inpatient rehabilitation, the following long-term goals were addressed with the client: the client will increase functional ability during tub/shower transfers with modified independence, and toilet transfers with modified independence; the client will increase independence with self-care to Independent for feeding, grooming, and UE dressing, and modified independent for LE dressing and bathing activities; and the client will complete household management activities and mobility with modified independence at wheelchair level.

In order to achieve the aforementioned goals, several short term goals were also created and adjusted as the patient achieved the required level of assistance, including: complete LE dressing with minimal assistance; complete toilet transfer with minimal assistance and slide board; complete tub transfer with moderate assistance; decrease right shoulder pain to minimal during transfers, < 3/10 pain; and complete cooking task wheelchair level with modified independence.
The client’s plan of care included weekly team consultation with the attending physician, case manager, nursing, physical therapy, occupational therapy, and recreational therapy. Co-treatments with recreational therapy and physical therapy were also completed. The occupational therapy plan of care upon initial evaluation also included: adaptive equipment appraisal and training, ADL/self care retraining, functional transfer/mobility training, safety/family education, therapeutic exercise, and family consultation.

After discharge from inpatient rehabilitation, several goals were created in cooperation with the client and his family based on the results of the MOHO assessments. The following goals were addressed: the client will be able to verbally state at least two different means of transportation to allow him to get to/from work; the client will be able to transfer to/from wheelchair to floor to complete work related tasks while in short-sitting and long-sitting with good safety; complete PNF patterns in the pool with minimum assistance for safety; and complete family training, wife to be independent with providing support during land and water-based PNF techniques.

Interventions

While in the inpatient rehabilitation unit, the client was required to complete daily ADL/self care tasks including dressing and grooming/hygiene in his hospital room in the morning prior to his first therapy session in the gym. The client was required to don “street clothes” including shoes daily. The client was able to incorporate PNF patterns during his bathing, grooming, and dressing tasks after demonstration by the occupational therapist and occupational therapy student. Occupational therapy interventions that took place in the rehabilitation gym included: mat activities, lower extremity Bioness, commode transfers, tub transfers, upper extremity exercises, cooking tasks, and weight-bearing in the standing frame.
The PNF basic procedures and techniques, as well as progression of positions, were utilized during mat activities. There are several functional treatment goals that can be met by utilizing mat activities as an intervention, such as: teaching and practicing functional activity (rolling and transitioning from one position to another); training stability in multiple positions; increasing upper extremity and lower extremity coordination; increasing strength for functional tasks; increasing muscle and joint mobility; and decreasing extension tone/normalizing tone. These therapeutic goals are in-line with PNF principles (Adler, Beckers, & Buck, 2008). The mat activities were completed in prone and supine to increase his strength and decrease extension tone in the client’s lower extremities. Prone occupations included: rolling from supine to prone; rolling from prone to side-lying; prone on elbows; prone on hands; quadruped; side-sitting; sitting on heels; kneeling; and half-kneeling. While he was prone on his elbows, the client completed scapular mobilization (pro/retraction and depression) and alternating upper extremity arm extension. The client would then focus on moving from prone to quadruped, and completed push-ups, pelvic anterior and posterior tilts, and maintained “child’s pose” and sitting back on his heels to stretch his quadriceps muscles. Supine activities included: rolling from prone to supine; rolling from supine to side-lying; rolling from supine to side-sitting; scooting in side-sitting; moving from side-sitting to quadruped; moving from side-sitting to long sitting; scooting in long-sitting; short-sitting (with legs over the mat); and scooting in short-sitting. While in short-sitting at the edge of the mat, the client also participated in reaching activities such as Wii Tennis. This activity required the client to focus on core strength and balance, while incorporating the upper extremity diagonal patterns necessary for swinging a tennis racket. The client was taught to stabilize in each position, and as his skills progressed, the focus moved to emphasize mobility and increasing skill level as directed by PNF principles (Adler, Beckers, &
Buck, 2008). When the client’s extension tone was increased, the client required moderate to maximum physical assistance by the occupational therapy student to achieve proper position of the pelvis during tilts, with her grip on either side of the pelvis, while providing stability at the feet and knees.

As discovered by Kobat, and summarized in Saliba, Johnson, and Wardlaw (1993), humans utilize diagonal and spiral movements involving the extremities and trunk during functional daily tasks. As observed during the PNF initial evaluation, the client exhibited difficulties with lower extremity dressing tasks. These tasks were then broken down into the basic motions necessary to complete them, and were the focus of the previously mentioned mat activities. Once mastered on the mat, the PNF techniques were utilized during dressing occupations while in inpatient rehabilitation. The client would complete lower extremity dressing while in long-sitting in his bed. The client learned to set his clothing at his bedside during the evening, so he would not require set up assistance from the occupational therapist during the morning ADL sessions. The client would utilize lower extremity D2 flexion and extension to don/doff his shorts, socks, and shoes. The client would fully dress one lower extremity at a time. While in the “curtsy” position of D2 flexion, the client would pull his shorts over his feet and up towards his knees, then don his sock and shoe for that extremity prior to completing D2 extension. Then, the client would repeat these steps to dress his remaining lower extremity, taking advantage of D2 extension to pull up his shorts. At admission to inpatient rehabilitation, the client was dependent for lower extremity dressing, and by the end of two weeks he required less assistance and was modified independent for lower extremity dressing at bed level.

After discharge from outpatient occupational therapy, the client was able to stand unsupported and reach for items. During this time, home visits focused on incorporating PNF
techniques into bathing, grooming, dressing (when standing), cooking, and cleaning tasks. The client would complete D1 and D2 upper extremity flexion and extension patterns as he reached for products and ingredients during grooming, bathing, and cooking tasks while maintaining his standing balance. Items were kept in their original place to maintain a naturalistic setting, but it still required the client to reach forward, up, out to the side, and across his body. Cleaning tasks included washing the dishes, folding laundry, and shampooing the carpet. The client was required to clean the dishes in standing, but lowered himself to the ground for the laundry and carpet shampooing tasks. When folding the laundry, the client would begin in long-sitting, and then abduct his lower extremities at the hip to form a “V” with his legs. The client would place the laundry to either side of himself, fold the items in midline, and then place the folded clothes in a basket between his legs. When the client shampooed his carpet, he vacuumed at wheelchair level to conserve energy, and then lowered himself to the floor to use the shampooing attachment. This required the client to transition from long-sitting to prone, and then from prone to quadruped, and then to kneeling. From the kneeling position, the client would return to and from quadruped as he stretched his upper extremity forward, out to the side, and across midline, switching arms back and forth as he fatigued. The client required minimum physical assistance for balance and stabilization at the foot/ankle as his extension tone would push him back as he was pushing the shampooer forward. The client also continued with the mat exercises once he was at home. The client mostly completed the exercises and stretches on the floor in his living room, reporting that they helped decrease his tone so he could complete his occupations of daily living.

During follow up visits, the client participated in five water-based interventions. Clients with incomplete spinal cord injuries can benefit from water-based interventions to supplement
the benefits of land-based interventions (Salzman, 1998). Water-based interventions provide further therapeutic benefits that cannot be provided on land.

Outcomes

The majority of the short term goals were achieved prior to discharge. The short term goals that were achieved included: complete LE dressing with modified independence; complete tub transfer with stand by assistance and slide board; complete toilet transfer with slide board and supervision; decrease right shoulder pain to minimal during transfers, < 3/10 pain; and complete cooking task wheelchair level with modified independence. Two short term goals were not met by discharge, including: complete tub transfer with stand by assistance from commode; and complete toilet transfer with rolling walker with moderate assistance during stand-pivot. However, both of these short term goals were assessed during follow-up visits at the client’s home, and were met after discharge. The client met the following goal: client will complete household management activities and mobility with modified independence at wheelchair level; and the client will increase independence with self-care to Independent for feeding, grooming, and UE dressing, and modified independent for LE dressing, excluding bathing activities. The client did not meet the following long term goal by discharge: client will increase functional ability during tub/shower transfers with modified independence, and toilet transfers with modified independence.

Upon discharge from inpatient rehabilitation, the client had increased his scores on the Functional Independence Measure (FIM). The client improved his feeding, upper body dressing, and grooming abilities from a 5 to a 7. The client improved his bathing, toilet transfers, and lower body dressing from a 1 to a 6. The client’s bed, chair, and wheelchair transfers improved from a 2 to a 6. The client also improved his tub/shower transfers from a 0 to a 6.
The client significantly underestimates his progress since discharge. The client focuses solely on his limitations, specifically his inability to walk and drive. The client does acknowledge his functional improvements around the household, but reports that he is standing during those tasks primarily because he believes that it will help him walk again, and doesn’t focus on how this has improved his functioning. The client reported feeling like he was not doing something right, and observations of the client lend to the idea that he is looking for the one thing that is missing that will make him be able to walk. The client consistently discusses how he had a physician and an outpatient therapist who stated that he would be walking independently by the end of six weeks. This information may have been taken out of context, but since the six weeks have passed and the patient is not walking independently, he feels like he is doing something wrong, which helps explain his persistence with incorporating ambulation during interventions. The client currently has the idea that if he is able to strengthen his hamstrings, then his quadriceps will not overpower his hamstrings and he will be able to walk perfectly then.

The client met his self-identified goals that he set during inpatient rehabilitation, including being independent in cooking and dressing. At discharge, the client was able to complete his occupations of daily living at wheelchair level. Since discharge, the client has taken every opportunity to stand during occupations, which he was unable to do prior to discharge secondary to requiring bilateral upper extremity support on the walker to support his body when standing. The client is currently able to stand for approximately 15 minutes at a time, using the wheelchair for rest breaks, when washing the dishes, retrieving items from cabinets and the freezer, cooking, and most recently when dressing. However, during follow-up visits the client had set goals such as being able to walk household distances independently without an assistive device, and to be able to drive again. No progress has been made towards his driving goal, but different car/van modifications and hand controls have been discussed with the client. The client, however, does not wish to have a modified vehicle because his goal is to drive like “normal” people do. Progress has been made towards his functional ambulation goal. The client is currently able to functionally ambulate short distances in his home with the use of a rolling walker and
supervision. At discharge, the client was requiring moderate assistance to complete ambulation from the bathroom doorway to the commode with a rolling walker.

Since discharge, the client has secluded himself from his friends, and requires encouragement for community re-entry. The client reported that it was just too much of a hassle to go to a friend’s house, or to complete leisure tasks he used to enjoy such as camping and wilderness walks. Even after extensive encouragement and being provided with resources that would make these leisure tasks possible at the wheelchair level, the client continues to refuse community occupations, reporting that “it would really get me down seeing other people walking around and doing things how I used to be able to.” These issues were important to address as studies indicated that decreased leisure and work participation decreases quality of life in individuals with spinal cord injuries (Schonherr, Groothoff, Mulder, & Eisma, 2005). A study by Pentland, Harvey, Smith, and Walker (1999) found that men with SCI are socially isolated relative to their able-bodied peers, and reported a need for rehabilitation to go beyond functional independence so that persons with SCI can expand both their leisure and productivity roles, thus becoming socially integrated into society. Despite the client’s lack of leisure and social interactions, the patient has returned to work and has made the necessary accommodations to successfully meet his job expectations.

Several follow-up visits were completed with the patient at his home, workplace, and at the local YMCA. When at the client’s home, the client was able to demonstrate sit to stand from an office chair to a rolling walker with supervision and good safety. The client functionally ambulated from his bedroom to his couch in the living room with supervision and rolling walker. Minimal foot drop was noted during ambulation; however the client was not wearing his AFO braces. With the AFO braces on, his foot drop diminished. The client completed stand pivot transfers x 2
from the couch to his wheelchair. The client could adequately navigate around his house with his wheelchair during all home visits. Once in the kitchen, the client was able to retrieve items from the refrigerator and freezer to prepare dinner for his family. The client placed the ingredients on his lap and wheeled them over to the stove. Once at the stove, the client requested set up assistance to bring him his walker. The client was able to stand x 15 minutes x 3 trials while cooking on the stovetop and washing dishes. The client returned to sitting in his wheelchair during rest breaks, and rested his stomach against the counter when standing during task completion. When the client finished cooking, he was able to plate the food and bring the plates to the kitchen table by placing them on a walker tray he had purchased. The client had purchased the walker tray after experiencing increased frustration after spilling food and dropping plates when transporting food from the counter to the kitchen table by placing the plates on his lap.

During another home visit, the client was able to functionally ambulate from the bathroom doorway to his toilet with stand by assistance and a rolling walker. From the toilet, the client was able to complete a sit pivot transfer without a slide board to the shower bench and replicate sub-occupations necessary when showering. From that point, the client transferred back over to the commode with stand by assistance, and required assistance to remove the shower bench from the tub. The client had told the student occupational therapist that he used to enjoy taking hot baths, preferably over showering, and as a relaxation technique. So, with the shower bench removed, the student occupational therapist demonstrated techniques to complete a safe tub transfer. Then, the student provided moderate assistance for the first trial. On the second trial, the client was able to complete the transfer with minimal assistance. From then on, the client demonstrated the toilet to tub edge transfer with his wife providing contact guard assistance. Once on the back ledge of the tub, the client was able to lower himself down into the tub, and
lean forward to reach the faucet and bathing supplies. However, the client consistently required
moderate assistance to transfer out of the tub. The client’s wife was able to learn safe patient
handling and complete this task with her husband. During home visits, the client also
demonstrated independence with his home exercise program (HEP), and stated new fitness goals,
including a plan to reach those goals.

One workplace visit was also completed on the Friday of his first week back to work. The
client’s co-workers had already accepted the recommendations of the workplace evaluation that
occurred during inpatient rehabilitation regarding creating an ergonomic workspace. Prior to
hospitalization the client’s office was not wheelchair accessible due to the arrangement of his
furniture (see Appendix C). After an outing to his workplace during inpatient rehabilitation, the
client made arrangements with the co-worker he shares his office with to have the office
furniture rearranged to enable him to function in the office at wheelchair level (see Appendix D).
Further recommendations after the initial workplace visit included installation of automatic doors
(or push buttons to open the door), and to raise the height of the client’s desk to accommodate
the client’s legs to fit under the desk when in his wheelchair. The client’s boss was informed of
the recommendations, and began the paperwork process to make those accommodations. A
workplace visit at the end of the client’s first week back to work (two months after the initial
visit), revealed that the aforementioned accommodations had not yet been made. Further
discussions with the client’s boss and human resources were conducted by the student
occupational therapist to explain the reasoning behind the recommendations and the likelihood of
the client suffering from shoulder pain and/or injury if the automatic doors are not installed.

Perhaps the most unique aspect to the client’s follow-up care was water-based
interventions. The client is a member of the local YMCA. The client enjoys swimming with his
family, but had not returned to the YMCA since his discharge. The occupational therapy student met the client and his family in the lobby at the YMCA. Prior to entering the pool, the student occupational therapist and the client discussed workout equipment that would be beneficial to the client, as this was a concern the patient brought up during the MOHO assessments. The client was required to transfer from his wheelchair to the different pieces of workout equipment to ensure the client’s safety, and to assess how much assistance he would need to utilize the equipment. The client was able to transfer onto the equipment safely with stand-by assistance, but was dependent for leg placement over push bars on the leg equipment. The amount of assistance the client required with different exercise equipment was discussed with the client’s wife prior to heading to the pool locker room. The YMCA had a special needs locker room that the client was able to utilize. The client remained in his wheelchair, and wheeled out onto the pool deck. One of the lifeguards provided a wheelchair for temporary use so that the client did not have to get his wheelchair wet. The client required contact-guard assistance to complete a wheelchair to wheelchair stand-pivot transfer secondary to the wet slippery pool deck. Once in the wheelchair, the lifeguard (for liability purposes) wheeled the client down the beach entry aspect of the pool (see Appendix E). The occupational therapy student removed the leg rests, and provided minimal assistance as the client transferred out of the wheelchair and reached for the hand rail of the pool. The client’s wife and daughters also entered the pool.

Once in the shallow end of the pool, the client required moderate assistance for balance to ambulate five feet without assistive equipment from the railing to an opposing ledge, with the student’s hand placement on either side of the client’s pelvis. The client utilized the ledge to complete lower extremity stretches. Then, the occupational therapy student began integrating PNF patterns of movement; utilizing different body positions (see Appendix F). During water-
based PNF interventions, PNF patterns can be done in a variety of body positions including standing, supine, sitting, or kneeling. There are also several other advantages of completing PNF patterns in the pool, including: the buoyancy of water; viscosity of water; surface tension; and can use principles of inertia, action/reaction, acceleration, surface area, and lever length to increase or decrease intensity (Ogden, 2002). The buoyancy of the water helps assist, resist or support the limb and the motion that you are trying to create. The viscosity of the water and surface tension can be utilized increase or decrease resistance throughout each pattern of motion.

In accordance to suggestions by Ogden (2002), the basic PNF D1 and D2 patterns were completed by the client while standing along the side of the pool, holding onto the edge for balance. The occupational therapy student also provided hands-on support for balance during these motions during the initial sessions. However, the patient did not require this support during subsequent follow-up water-based sessions. From there, the client was able to progress to a freestanding position to work on dynamic balance and coordination. The client also attempted these patterns in supine and side-lying with the use of a noodle for support along with the hands-on support from the occupational therapy student.

The occupational therapy student also challenged the client’s standing balance by having the client stand unassisted. On the first attempt, the client began to lose his balance after 15 seconds and resorted to reaching for the pool ledge. On the second attempt, the client was able to maintain balance for 45 seconds. The client completed three more trials, with the occupational therapy student creating waves around the client to increase the challenge for the client. The occupational therapy student also challenged the client’s balance by having him wave to his daughters, requiring him to look at his children instead of his lower body. The client was able to
tolerate 65 minutes of water-based interventions prior to becoming fatigued and requesting wheelchair transport out of the pool.

This occupation was meaningful for the client because he was able to participate in a previously enjoyed activity (swimming), alongside his wife and daughters. This was particularly meaningful since the client had informed the occupational therapy student that one of the things he did not like about outpatient therapy was that it took away from time he could have spent with his family. Also, this was the first time he had completed a community outing with his wife and daughters since discharge. The client also reported that he enjoyed the water-based therapy because he was able to reproduce patterns of movement that he was completing on a mat, but was pain free in the water. He also felt that the resistance of the water provided a better workout. Perhaps the most meaningful aspect of the water-based interventions was that the client stated that he felt like he was “normal,” and his wife stated that during these interventions it was the first time the client had stood and walked without the assistance of a walker and she agreed with the client by stating that “he looked like everyone else once he was in the pool.” Feeling and looking “normal” is extremely important to the client, as he had cancelled previously planned interventions on the basis that he did not want to look different, and did not want to see other people “who could walk around and do the things he used to be able to do.”

The client completed four other subsequent water-based PNF interventions with the occupational therapy student. The client’s family members were present during all of the pool interventions as well. The occupational therapy student incorporated all of the same aspects as previously described, but incorporated new challenges during the subsequent sessions. For example, during one of the sessions, the occupational therapy student was able to elicit the PNF patterns while playing “Simon Says” and doing the “Hoki Poki” with his wife and children.
During another session, the occupational therapy student was able to have the client envision other tasks when trying to complete PNF patterns of movement to elicit a more natural motion. This included having the patient do jumping jacks; pretend to cross country ski and speed skate, and play hacky sack. Once the client was able to master the hacky sack motions, the occupational therapy student utilized a Yo-yo for the patient to kick as if it were a ball. This way, the ball would not float away or sink. The aforementioned tasks were utilized based on information derived from Ogden (2002), which stated that jumping jacks incorporate D1 upper extremity motion and include internal and external hip rotation component. Bilateral reciprocal DR patterns are utilized during speed skating motions, and the client was required to touch his opposite hand to his foot during hacky sack. D2 patterns can be completed during the cross country skiing motion.

During the final water-based intervention, the client’s wife was able to demonstrate proper hand placement to provide stability and support of the client while he completed the PNF patterns of motion in the pool. The client and his wife were able to verbally state which motions to complete, and the client was able to demonstrate the patterns appropriately. Then, the occupational therapy student provided minimal assistance while the client sat down on the downward slope at the beach access entry to the pool. The water was chest deep when the client was sitting. The occupational therapy student sat next to the client and demonstrated a new way to complete the PNF patterns of movement while providing increased safety and independence for the client. The client was able to lean back on his hands, and since the pool bottom was at a slope, he could complete the lower extremity movements while seated. Not only did this allow the patient the ability to complete these motions without his wife’s assistance, but it allowed him
to play games with his daughters, such as ball toss, while receiving therapeutic benefits of the water and the patterns of movement.

Conclusions

The client was discharged from inpatient rehabilitation to his home to live with his family, as recommended by the Occupational Therapy Discharge Evaluation. Further recommendations upon discharge included receiving outpatient physical and occupational therapy, returning to work, and community reintegration. Since discharge, the client has completed two weeks of occupational therapy as allowed by his insurance company, and continues with outpatient physical therapy three times a week for one hour sessions. It was also recommended that the client complete follow up therapeutic interventions with the occupational therapy student until his wife has been educated to complete the interventions at home with the client independently.

At the completion of this case study, the client was independent with cooking, dressing, and cleaning tasks. The client has also returned to his previous workplace, and is able to complete most of his work-related responsibilities with the assistance of his co-workers when needed. The client has also made efforts to reintegrate back into the community and complete previously enjoyed leisure tasks, such as going to the pool with his family. He has also made reservations to go on a family cruise at the end of the summer. However, the client still requires encouragement and reassurance prior to engaging in previously enjoyed tasks. The client is receptive to educational materials on accessible facilities and parks, and is looking into accessible camp sites for return to his favorite occupation, camping with his family.

Implications from this case supports the use of occupations with the Perceptual Neuromuscular-Facilitation model of practice. By utilizing PNF with a client-centered model of
practice, such as MOHO in this case, will provide a basis to incorporate occupations that are meaningful to the client that naturally also involve PNF patterns of movement and techniques. This also has implications for occupational therapy program development. Occupational therapists could develop community based programs at settings such as the YMCA that incorporate PNF theory to water-based interventions. There is currently no such programming at the local YMCA. Given the psychosocial aspects that contributed to this case, programming could also be created to meet those needs. For instance, an occupational therapy program could build upon current support groups with the addition of community re-integration. Prior to each outing, the support group topic at the meeting could address the concerns and fears of the participants. For example, if a community outing was scheduled to go to the beach, the week before the outing participants would discuss concerns regarding the beach (e.g. Wheelchair accessibility, being stared at, etc.).

Further research should be completed on the use of PNF techniques during occupations in order to provide functional outcomes beyond what this case can provide. There is currently a lack of research of the effect of PNF when utilized with incomplete spinal cord patients. Such research could utilize occupations such as swimming, tennis, or golf. Other research studies should compare into the differences in psychosocial issues when the client is hospitalized, and during follow-up visits to assess whether there is an increase or decrease in life satisfaction and perceived functional outcomes. In this case the client was highly motivated during inpatient rehabilitation, but was demoralized after the reality of his obstacles and limitations post-discharge set in. Occupational therapists could also work the builders and contractors in association with exercise facilities to ensure that their facility is handicap accessible, including the exercise room (space between machines), locker rooms, and pool.

This case is innovative in that it incorporated a client-centered approach to PNF from the time of initial evaluation through follow up visits post-discharge. This enabled the interventions to build upon
previous interventions, and allowed the interventions to come full circle. The client was able to see how PNF techniques could be completed both on the mat/floor and during everyday occupations such as cooking, cleaning, dressing, and swimming. The interventions were specifically chosen in collaboration with the client based on the client’s needs and desires. Providing client-centered interventions is not new knowledge to the field of occupational therapy by any means. However, it is hoped that occupational therapists will gain an understanding of the importance of theory-based practice from reading this case, and understand that interventions can exceed beyond the therapy gym. This case can also revive the way that outpatient and home health occupational therapy is perceived. The use of aquatic therapy during outpatient and home health occupational therapy is also reinforced by the current health care trend of shorter hospital stays. Occupational therapists can utilize aquatic therapy PNF techniques while having the client participate in an enjoyable occupation that still allows them to increase their functional ability.
References


Appendix A

Cake Decoration Occupational Analysis

One of the therapeutic occupations that completed with the client included making a fondant cake and cup cakes as a surprise for the client’s wife and daughters for Valentine’s Day. This occupation was very meaningful and purposeful for the client. One of the client’s hobbies was professional cake decorating. The client decided to take some cake decorating classes after his wedding, when he realized how expensive professional cakes were. The client was interested in the amount of work that was required to create such cakes, and has been creating cakes for his family members ever since. The client had his wife bring in pictures of cakes that he had completed in the past, as well as his cake decorating books. The client retrieved his cake decorating kit and available supplies during the home evaluation. The client was able to transport the materials into the Bayfront Medical Center van on his lap, while he propelled his wheelchair. The planning process was completed while the client was weight-bearing in the standing frame during a 30 minute occupational therapy session. The client flipped through four cake decorating books, focusing on Valentine’s Day themed cakes. From those books, the client selected the cake and cupcake design he thought his wife and children would enjoy the most, and made a list of required ingredients. The occupational therapy student and the supervising occupational therapist were able to provide the hand-held mixer, eggs, sugar, butter, heart-shaped cake pans, heart-shaped cup cake holders, heart-shaped fondant and cookie cutters, heart-shaped molds, and heart decorations. The occupational therapy student retrieved the ingredient’s list from the client, and purchased the following required ingredients: four boxes of white fondant, one bag of red chocolate melts, one box of strawberry cake mix, two butter cream frosting containers, heavy whipping cream, and fresh strawberries. The remaining ingredients (red fondant, fondant
coloring, frosting coloring, white icing, chocolate icing, and cake decorating plates, and decorating utensils) were all provided in the client’s cake decorating kit. All materials were stored in the ADL room of the rehabilitation gym so that the project would remain a surprise for the client’s wife. This occupation took place wheelchair level over four days, and taking seven hours to complete.

On the first day of the baking occupation, the client completed the following sub-occupations over a two hour extended therapy session: baked the cake, baked cup cakes, made chocolate molds, made cake filling, and decorated Valentine’s Day cards for his family. In order to bake the cake, the client was required to retrieve ingredients from the fridge, cabinets, and countertop. The client placed ingredients on his lap and transported them to the kitchen table. The client utilized a hand-held mixer to stir the cake batter, and a spatula to pour the batter into the heart-shaped cake pans. The client pre-heated the oven, placed the pans onto a cooking sheet, and then into the oven, using good kitchen safety. While the cake was in the oven, the client prepared the cup cake batter, and poured the batter into the heart-shaped cup cake holders. When the cake was finished baking, the client utilized oven mitts and hot pads to get the pans out of the oven. The client placed the pans onto the stove-top and closed the oven, then returned to the kitchen table to retrieve the cup cakes. While the cup cakes were baking, the client opened up the bag of red chocolate melts and poured them into a microwave safe bowl that was retrieved from a cabinet. The client read the instructions on the label, and heated the melts in the microwave, stirring them occasionally with a spoon. Once the chocolate was at the proper consistency, the client brought placed the bowl on his lap, utilizing a hot pad, and brought the container to the kitchen table. Then, the client spooned the chocolate into the heart-shaped molds. Since the client was still waiting for the cup cakes to finish baking, he decided to make the cake filling.
The client brought the container that the chocolate was in over to the sink and cleaned it. After he had dried the container, he re-read the instructions he had found on the internet for making strawberry filling. The client whipped the heavy whipping cream with the hand-held mixer. Once it was at the correct consistency, the client smashed a cup of strawberries and added the mixture to the whipping cream, along with some sugar as directed. The client continued to whip the mixture until it became the consistency he desired. At this time, the cup cakes were ready to get out of the oven. The client wheeled up to the side of the oven, put on the oven mitts, and opened the oven door. The client placed the oven pans on the counter top, on top of hot pads, and closed and turned off the oven. Then, the client returned to the kitchen table to retrieve toothpicks from his decorating kit. The client completed the “toothpick” check on the cakes and cupcakes before cleaning up. The client washed all of the dishes in the sink, wiped down the counter and kitchen table, and left the cakes to cool-off.

On the same day, the client returned for his afternoon therapy session and covered the cake and cupcakes with plastic wrap, and placed them in the refrigerator. The client returned to the rehabilitation gym, and was assisted by the occupational therapy student and her supervising occupational therapist into the electric standing frame. The afternoon therapy session consisted of a co-treatment with recreational therapy where the patient decorated Valentine’s Day cards for his wife and daughters while weight-bearing in the standing frame. The client was wearing his abdominal binder and TED hose during this process. The co-treatment lasted for 60 minutes while the client decorated the cards with materials provided by the recreational therapist and discussed his cake decorating plan for the following day. Upon completion of the cards, the client was lowered from the electric standing frame and was finished with occupational therapy for the day.
On the second day of the baking occupation, the client completed the following sub-occupations: making red and pink fondant, icing the cake, cutting out heart-shaped fondant, and decorating the cake. The client kneaded the white fondant until it was soft, incorporating upper extremity PNF patterns per instruction by the occupational therapy student. Once it was pliable, the client separated enough fondant to make the white and red decorations and covered the separated portion with plastic wrap. Then, the client began adding small amounts of pink fondant coloring to the white fondant. In order to attain the color of pink he desired, the client repeated the kneading and adding fondant coloring process several times. This process is very time consuming, and required hand and upper extremity strength. Once the correct color of pink was attained, the client rolled out the fondant until it was thin with his rolling pin. The client wheeled over to the fridge and took out the cake pans. Once he had achieved a level layer of icing, the client brought the decorating plate over to the rolled out fondant. The client carefully placed the fondant over the cake, and smoothed it out with a leveling tool from his kit. The client worked from the top of the cake, then down to the sides. The client utilized a sharp paring knife to cut away excess fondant, and continued to smooth the fondant over the cake, ensuring to maintain the heart shape. Then, the client used the small overlap of fondant to flip underneath the cake, so as to not leave any visible cut lines on the cake.

The client returned during his afternoon session and worked on decorating the cake for two hours, thirty minutes of which was a co-treatment with recreational therapy. During the two hours, the client kneaded and colored part of the remaining fondant red, leaving a small portion for the white banner. The client cut out the heart shapes and placed them on the parchment paper. The client decorated the cake with the red hearts by applying a small amount of water on the red heart with the paint brush and then placing them on the cake (with the water acting like glue).
Then, the client rolled out the white fondant and cut out a thin strip, placing it across the cake and rolling the ends to give the appearance of a banner over the cake. Lastly, the client re-rolled some of the excess pink fondant and hand-cut out letters to spell out “love” and placed them on the white banner of the cake (see Appendix E). The client covered the cake with plastic wrap and placed it in the fridge, and he cleaned up his work area. This concluded the client’s occupational therapy session for the day.

On the third, and final, day of the cake decorating occupation, the client decorated the heart-shaped cupcakes with a design he thought his daughters would enjoy. The client had placed the Valentine’s Day cards and a gift he had his friend make for his wife and daughters in his wheelchair bag prior to coming to therapy. At this time he placed the cards and gifts on the table and returned to his room to wait for his wife and daughters to arrive. The client had told his wife he had used the decorating kit to make a cake for a pot lock that the therapists were having that afternoon, and told her he wanted her to come see it. When his wife entered the rehabilitation room to see her surprise, she did not even think the cake was for her at first, and thanked the staff for facilitating this occupation for her and her daughters.

No changes were necessary during the cake decorating occupation since the client was the primary planner and knew what this process required. The client completed the occupation in a safe manner and was able to utilize all of the kitchen appliances that he typically uses at home. No safety concerns were noted during this occupation. By completing this occupation, the client met the following short term goal: complete cooking task wheelchair level with modified independence.

This occupation was very meaningful and purposeful for the client and his family. The client used to bake cakes for his family members on special occasions, and did not have the
opportunity to do so since he had been in the hospital. The fact that it was a surprise for his wife and daughters was significantly meaningful. The client is very family-oriented, and values the time he gets to spend with them. He married his high school sweetheart, and would do anything to make his wife and daughters happy. He was unable to celebrate Christmas or New Years the way he would have liked since he was in the hospital, so he was really interested in this occupation and wanted to do something nice for his family for Valentine’s Day. The client is also the primary cook in the household, and had not had the opportunity to complete a cooking task prior to this occupation. By successfully completing this task, the client reported having increased confidence in his ability to cook and navigate his kitchen upon discharge. He also developed an increased awareness (personal causation) of modifications that would need to be made in his kitchen at home in order for him to be able to cook, such as moving items to lower cabinets so he could reach them.
Appendix B

Cake Decorating Occupation Pictures
Appendix C

Office Space Prior to Re-arrangement
Appendix D

Office Space After Re-arrangement

- Doorway
- Co-Worker's Desk
- Work Table
- Patient's Desk
- Shelves
- Work Table
Appendix E

YMCA Facility
Appendix F

PNF Patterns Used in Pool