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Task-Specific Resistance Training Bedside for an 80-Year-Old Deconditioned Female: A Case Report

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TASK-SPECIFIC RESISTANCE TRAINING BEDSIDE FOR AN 80-YEAR-OLD DECONDITIONED FEMALE: A CASE REPORT

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ABSTRACT

Background: The purpose of this case report was to describe the use of task-specific resistance training bedside on an 80-year-old deconditioned female.
Case Description: The patient was a retired 80-year-old African-American female seen in a skilled nursing facility who was hospitalized due to defibrillator firing with atrial fibrillation with abdominal pain and *Clostridium Difficile.* Three weeks prior the patient was hospitalized for a right inguinal hernia repair.
Outcomes: The patient was unable to return to her prior level of independence for all functional mobility, yet the patient increased her gait distance, improved her lower extremity strength evidenced by manual muscle testing and decreased the level assistance needed with bed mobility, transfers and gait as measured by the functional independence measure.
Discussion: Although this single case report limits generalizability, this case indicates that task-specific resistance training as a method for treatment of deconditioning may benefit other older adults who are confined to their room to complete physical therapy.

INTRODUCTION

Often times individuals require hospitalization to treat an illness or injury, but hospitalization itself can have detrimental effects to people, specifically older adults.[1] Hospitalization can lead to complications unrelated to the problem that caused the admission, including deconditioning.[1] Deconditioning is a complex process of physiological change that can affect multiple systems within the body and often results in functional decline, specifically in muscle strength, aerobic capacity, and diminished pulmonary ventilation.[1,2] Functional decline is a loss of independence in self-care activities which includes basic activities of daily living (ADLs) (transferring in and out of bed, walking).[2,3] Deconditioning is recognized as a distinct rehabilitation condition by the American Board of Physical Medicine and Rehabilitation.[4] Research has shown that of 60 functionally independent individuals 75 years or older admitted to the hospital from their home for acute illness, 75% were no longer independent on discharge.[1] Even with interventions targeted to increase functional independence during acute admission, many older adults will continue to experience deconditioning during their hospital admission, impacting discharge planning and preventing direct return to the home environment.[2] Sub acute rehabilitation settings can be used as an alternative or bridge in these cases. Reconditioning can be a long process, depending on the duration of inactivity, and overwhelming to patients and caregivers.[5] A treatment plan tailored to the needs of each

individual must be established. The most significant deficits for patients with hospital associated deconditioning include decreased lower extremity muscle strength and endurance, as well as a decrease in basic mobility and ambulatory endurance.[4] Additionally, difficulty in transferring, the ability to rise in and out of a bed and chair, is a common problem in older adults.[6] Physical therapy is an essential aspect of rehabilitation for patients with these impairments. In situations where the patient is unable to leave the room, bedside therapy is the other option. A study that focused on bedside physical therapy to prevent deconditioning proved that bringing physical therapy to the bedside of patients that cannot leave their room has led to improved physical conditioning and fewer falls.[7]

There is also evidence that supports task-specific resistance training as beneficial for increasing the overall ability to complete transfer tasks in activity of daily living-impaired adults.[8] Participants were aged 65 years and older, who reported requiring assistance (from a person, equipment or device) in performing at least one of the following activities: transferring, walking, bathing, and toileting.[8] In response to bed- and chair- rise task-specific resistance training interventions over 12 weeks, the ability of the older adults to perform a set of bed- and chair- rise tasks increased.[8] Ambulatory endurance training, with or without gait aids, is an imperative component of the PT program for deconditioned patients.[3] This includes walking progressively longer distances and tracking progress with each

therapy session.[4] Clinical practice guidelines identify a substantial therapeutic role for physical activity in coronary heart disease[9,10] and hypertension.[9] For example, lower risks of cardiovascular disease have been observed with just 45-75 minutes of walking per week.[9]

Hospitalizations also increase the probability of acquiring a healthcare-associated pathogen, specifically *Clostridium Difficile* (*C. Difficile*). The incidence and severity of *C. difficile* infection have increased in many parts of North America in the past few years.[11] Moreover, patients in the hospital with *C. difficile* infection are more likely to be discharged to a LTCF.[11] The greatest risk factors for C. difficile infection are hospitalization, exposure to antimicrobial agents, and advanced age.[11] A national point-prevalence survey for C. difficile infection conducted in 648 hospitals in the United States (12.5% of all acute-care facilities) in 2008 found a prevalence of 13.1 per 1,000 inpatients. The majority (69%) of the affected patients were aged 60 and older.[11]. Further research revealed a 43% spike in *C. difficile*-associated disease, including severe diarrhea, among patients at hospital discharge between 2000 and 2001.[12] Data came from the Centers for Disease Control and Prevention (CDC) annual National Hospital Discharge Survey, which included records from more than 300,000 patients at short-stay hospitals annually. The study suggested the increased exposure to anti-microbial drugs and healthcare facilities, as well as decreased defenses among the elderly, may contribute to the problem.[12] The incidence of

Clostridium difficile infection (CDI) as well as the populations at risk have increased significantly in the last decade.[13] The use of private rooms and implementation of contact precautions have been successful in limiting transmission of C. difficile.[11]

Groin hernia repair is a common surgical procedure and postoperative recovery is uncomplicated in most patients.[14] Some patients, however, continue to complain of chronic groin pain or discomfort for months or even years after hernia repair.[14] Additionally, Atrial fibrillation is the most common arrhythmia encountered in clinical practice and is associated with significant morbidity and mortality.[15]

The literature on deconditioning focuses on older adults yet doesn't incorporate the incidence of back to back hospitalizations that are accompanied by *C. Difficile* infection, necessitating rehabilitation to be completed in the patient's room. Therefore, the purpose of this case report was to describe the use of task-specific resistance training bedside on 80-year-old deconditioned female.

CASE DESCRIPTION

Subject

The patient for this case report was an 80-year-old retired African-American female seen in a skilled nursing facility. The patient was referred from an acute care hospital for physical therapy evaluation and treatment.

The patient presented to therapy was recently hospitalized due to defibrillator firing, atrial fibrillation with rapid ventricular rate and abdominal pain with *C. Difficle*. Three weeks prior, the patient had been hospitalized due to a right inguinal hernia with repair and Endoscopic Retrograde Cholangiopancreatography (ERCP) with stent and accordion drain to the gallbladder. Related past medical history included tissue mitral valve replacement, Automatic Implantable Cardioverter Defibrillator, chronic coagulation, hypertension, mitral valve disorder, and coronary artery disease. Medications the patient was on included Amiodarone, Metoprolol Tartrate, Lactobacillus Rhamnosus, Furosemide and Enoxaparin Sodium. The patient presented at the time of the initial physical therapy examination with complaints of weakness and pain in her abdomen with movement spanning the past 4 weeks. The physical therapist's examination and intervention focused on functional testing and training, lower extremity strengthening, and balance training to return home safely with family. Prior to admission, the patient lived alone in a first floor apartment with no exterior or interior steps. She was independent with all functional mobility using a single point cane to ambulate. She explained she had not been able to get out of bed independently since her hospitalization for the hernia repair, which was 1 month prior to her admission to the SNF. The patient's goals are outlined in Table 1. The goals included being able to return home with her daughter as her primary caregiver and to increase independence in

bed mobility, transfers and ambulation. She stated her personal goal was to be able to walk to the bathroom.

The patient expressed willingness to participate in the physical therapy plan of care as outlined in this case report.

Table 1

Goals	Outcome Measure
Gait: ambulate 25 feet with least restrictive device in order to walk to the bathroom	Measure distance ambulated daily, Functional Independence Measure (FIM)
Sit to stand transfer with Min Ax1 with least restrictive device	FIM (motor)
Bed Mobility: supine to sit with Min A x1	FIM (motor)
Bed to chair transfer with Min A x1 with least restrictive device	FIM (motor)
Strength: increase BLE to 4-/5	Manual Muscle Testing.

EXAMINATION

Systems Review

The initial encounter began with the patient lying in a hospital bed. Cognition was found to be intact with the patient alert and oriented to person, place and time and was able to follow simple commands. She required 2 liters supplemental oxygen via nasal cannula with her 02 saturation rate at 94% at rest. The patient was unable to complete basic

functional activities (e.g. bed mobility, transfers, and ambulation) with complaints of lightheadedness upon sitting at the edge of the bed demonstrating decreased strength in bilateral lower extremities (BLE). She was unable to go from supine to sit in bed without maximum assistance of 2 people and was unable to sit unsupported at the edge of the bed without minimum assistance of 1 person. The surgical incision closure site from the hernia repair was intact. Given the fact that she had been medically cleared following the defibrillator firing and atrial fibrillation, physiological signs and symptoms for cardiac concern were monitored but were not an issue throughout care. Oxygen saturation rate fluctuated from 85 - 95 percent with activity and was treated with rest and nasal breathing techniques. Slight edema, 1+, with no lasting impression was present in BLE below the knees.

CLINICAL IMPRESSION

The findings from initial examination revealed extreme muscle weakness with concurrent pain with movement, increased dependence for all functional mobility, decreased activity tolerance and need for supplemental oxygen. With blood pressure and heart rate within normal limits throughout evaluation, cardiac concerns were not a focus of therapy. The focus of treatment would be on restoring functional mobility and strength, rebuilding independence with ADLs and prevention of deterioration.

TESTS AND MEASURES

Manual Muscle Testing (MMT)

The patient's muscle strength was extremely impaired (see Table 2). Research reports that MMT is the most commonly used method for documenting impairments in muscle strength and is a valid measurement.[16] A literature review analyzed more than 100 studies on the reliability and validity of MMT and reported that there is evidence of good reliability and validity in the use of MMT for patients with interrater reliability of .82-.97 and test-retest reliability of .96-.98.[17] Additionally, MMT has content validity because the test construction is based on known physiologic, anatomic and kinesiologic principles.[17]

Table 2

Manual Muscle testing	Admission	Discharge (4 weeks later)
Bilateral (B) Hip flexor	1/5	3+/5
B Hip abductor	1/5	3+/5
B Knee flexor	1/5	3+/5
B Knee extensor	1/5	3+/5
B Ankle dorsiflexor	3+/5	3+/5
B Ankle plantar flexor	3+/5	3+/5

Gait

The physical therapist performed gait analysis due to the impairments found during examination, including decreased BLE strength and due to the patient's goal to walk to the bathroom. Gait evaluation is based primarily on

clinical observation and is the accepted manner of judging how well a patient is walking.[18] The patient had gait deviations in forward head and trunk, decreased step length, cadence and most importantly gait distance tolerance was severely limited. For the purpose of this study, gait evaluation and analysis was measured by distance in feet. Using distance walked, the therapist was able to gather objective, quantitative measurements of the patient's gait.[18]

Functional Independence Measure (FIM)

The motor portion of the Functional Independence Measure (FIM) was used to assess the patient's function and to provide a baseline measure for tracking progress and outcomes. The FIM 18-item rating scale assesses self-care, bowel and bladder management, mobility, communication, cognition and psychosocial adjustment.[19] Each item is rated on a scale from 1 (total assistance) to 7 (complete independence).[19] The FIM is a seven-point rating scale created as part of the Uniform DATA System for Medical Rehabilitation.[20] It was designed to assess the ability to carry out activities of daily living (ADLs). The FIM has been shown to have high interrater reliability, with interclass correlation coefficient of .97 for the total FIM (functional outcome differences) and .96 for the motor domain (interrater reliability of the 7 level FIM).[21] A separate study compared the reliability, validity and responsiveness of the motor subscale of the FIM in inpatients with stroke receiving rehabilitation. It was reported that the FIM had high

concurrent validity with intraclass correlation coefficient of $\geq$.83, high internal consistency with coefficient of $\geq$.84 and a high responsiveness $\geq$ 1.2.[22] The FIM data reported here is according to the total FIM, but standard practice for physical therapists at the skilled nursing facility was analyzing bed mobility, transfer, locomotion and stairs and the others were assessed by other disciplines. These measures, though not established valid as the total motor portion of the FIM, provided an objective baseline measurement relevant to function and patient goals. Bed mobility required maximum assistance of 2 people, corresponding to a FIM score of 1. See Table 3 for the FIM scores for bed mobility, transfers, and locomotion. Stair climbing remained a 0 throughout treatment as it wasn't a goal and the patient had no exterior or interior stairs in her home. Transfers and locomotion with walking were assessed during the plan of care due to the patient's weakness and complaints of lightheadedness during examination. When attempting to initiate rolling from supine to a side-lying position, she was unable to perform hip and knee flexion in preparation to scoot toward the edge of the bed (EOB) with complaints of pain in her abdomen and bilateral lower extremities. She required maximum assistance of 2 people to perform supine to sit, corresponding to a FIM score of 1. She was incapable of maintaining sitting balance without minimal assistance from the physical therapist. The physical therapist could not assess standing balance at the initial examination secondary to safety concerns due to insufficient trunk

control, weakness in the lower extremities and the patient's complaints of lightheadedness.

Table 3

FIM	Admission	Progress	Progress	Discharge
Bed mobility	1	1	3	3
Sit to stand transfer	0	1	3	4
Bed to chair transfer	0	1	3	3
Locomotion via walking with rolling walker	0	1	1	1

(0= Did not test, 1= Total Assistance- the patients expends less than 25% of the effort or the need of more than 1 person was required, 2= Maximal assistance- the patient expends between 25 to 49% of the effort, 3=Moderate Assistance-the patient requires more help than touching or expends between 50 and 74% of the effort. 4=minimal assistance- the patient requires no more help than touching and performs 75% or more of the task. In the case of locomotion, if the patient walks less than 50 feet, they are automatically scored a 1.[19])

Diagnosis

The patient presented with impairments in balance, strength, and pain as well as limitations in locomotion, transfers, and bed mobility. The results from MMT and inability to complete basic functional mobility tasks confirm the patient's diagnosis. These impairments correspond to the physical therapy diagnosis of generalized weakness/debility.

Prognosis

Typical recovery for an older adult with hospital associated deconditioning depends on many factors including the level of deconditioning, the patient's motivation and the patient's co-morbidities. The patient's prognosis was fair to good due to her high motivation to achieve her goals, high prior level of function, good cognition and desire to return home. There were a number of other factors evaluated in determining a prognosis for this patient. The main negative prognostic factor was the patient's extended period of inactivity due to amount of time spent in bed post hernia repair 3 weeks prior to the defibrillator firing incident. The consequences of prolonged immobility on older adults ($\geq$ 65 years old), compared to younger subjects, are that older adults are more sensitive to bed rest inactivity.[4] In a study that compared the effects of bed rest on lean tissue in older versus younger adults, the older adults lost 1 kg of lower extremity lean tissue in 10 days, whereas younger subjects in a 14 day bed rest study lost only 650 g.[4] In addition, her age, 80, puts her at greater risk for age-related loss of muscle mass, or sarcopenia.[23] Because physiologic and functional capacity often decline with age, the patient was at a greater risk for deconditioning. Research also shows that patients following an inguinal hernia repair should be back to work, including undertaking light lifting, within one to two weeks. (Hammond) Given the extended time the patient spent inactive post hernia repair, may have further impaired her

condition. Additionally, the diagnosis of *C. Difficile* further increased the patient's weakness and deconditioning.[12]

Plan of Care/Goals

The patient presented with impairments in strength, activity tolerance, and balance leading to deficits in gait, transfers and bed mobility. Over the course of 4 weeks of physical therapy, the plan for this patient was to be seen 5 days a week for 75 minutes a day to address impairments and the physical therapy goals.

Considering the patient's stated goals and level of functional mobility at the time of examination, goals were formulated to address her impairments. Goals in the area of strength, measured by manual muscle testing, were to increase overall BLE strength to 4-/5 in order to facilitate improved functional mobility at home. Goals in bed mobility, transfers and locomotion as measured by motor components of the FIM, were to decrease in level of assistance from maximum assist of 2 people (1/7) to minimum assistance (Min A) (4/7) for all functional mobility tasks to achieve greater independence functioning at home.

INTERVENTIONS

The patient received physical therapy treatments 5 days a week, 45 minutes a day for 4 weeks in the sub-acute rehabilitation setting of a SNF. The interventions specifically addressed the impairments as noted in the

examination which included muscle weakness in BLE, functional mobility, and activity tolerance with gait. Interventions were divided into 2 phases (Table 4). The first phase consisted of sessions 1 through 9, the first 2 weeks, and focused on bed mobility, transfers, and active range of motion of the lower extremities. Bed mobility focused on lateral scooting left and right in bed in supine and in sitting, rolling to the edge of bed, and scooting in sitting. Transfers focused on sit to stands and bed to chair transfers via stand pivot using a rolling walker. Active range of motion exercises of the hip, knee and ankle joints were completed while sitting in a chair. The second phase consisted of sessions 10-19, weeks 2 and 4, and focused on increasing aerobic capacity and gait distance as well as strengthening the lower extremities.

Table 4

	Week 1	Week 2	Week 3	Week 4
Dynamic Activities in sitting	X	X	X	X
Open/closed chain kinetic exercises	X	X	X	X
Transfer training	X	X	X	X
Bed Mobility activities	X	X	X	X
Elastic band resistive exercises	X	X	X	X
Gait training		X	X	X
Omnicycle		X	X	X
Dynamic balance activities in standing		X	X	X

Bed Mobility/Transfer Training

The patient was unable to perform a transfer and was unable to complete bed mobility without assistance from the physical therapist upon initial examination. Transferring function may decline as a result of acute illness and hospitalization, or analogously, improve as a result of rehabilitation.[6] To address the patient's impairments, a series of bed mobility and transfer tasks were implemented. The tasks were chosen to target functional limitations and to increase strength through functional activities. The patient was instructed from the supine position to perform bed mobility tasks of bridging, lateral scooting in supine, rolling to side lying, side lying to sit, lateral scooting in sitting, and to perform transfers from sit to stand and bed to chair transfers with a rolling walker.

Strength

Due to the very low levels assessed during manual muscle testing, a strengthening program was implemented. The strengthening program consisted of various functional activities, resistive band exercises, and open chain kinetic and closed chain kinetic exercises that targeted the BLE's. Strength training is an effective intervention to improve muscle strength, power output, and muscle mass in healthy and frail elderly populations.[23] Additionally, a study reported that following a leg resistance training

program, one frail older adult became able to rise from a chair without armrest use and others felts that rising from a chair was easier.[8]

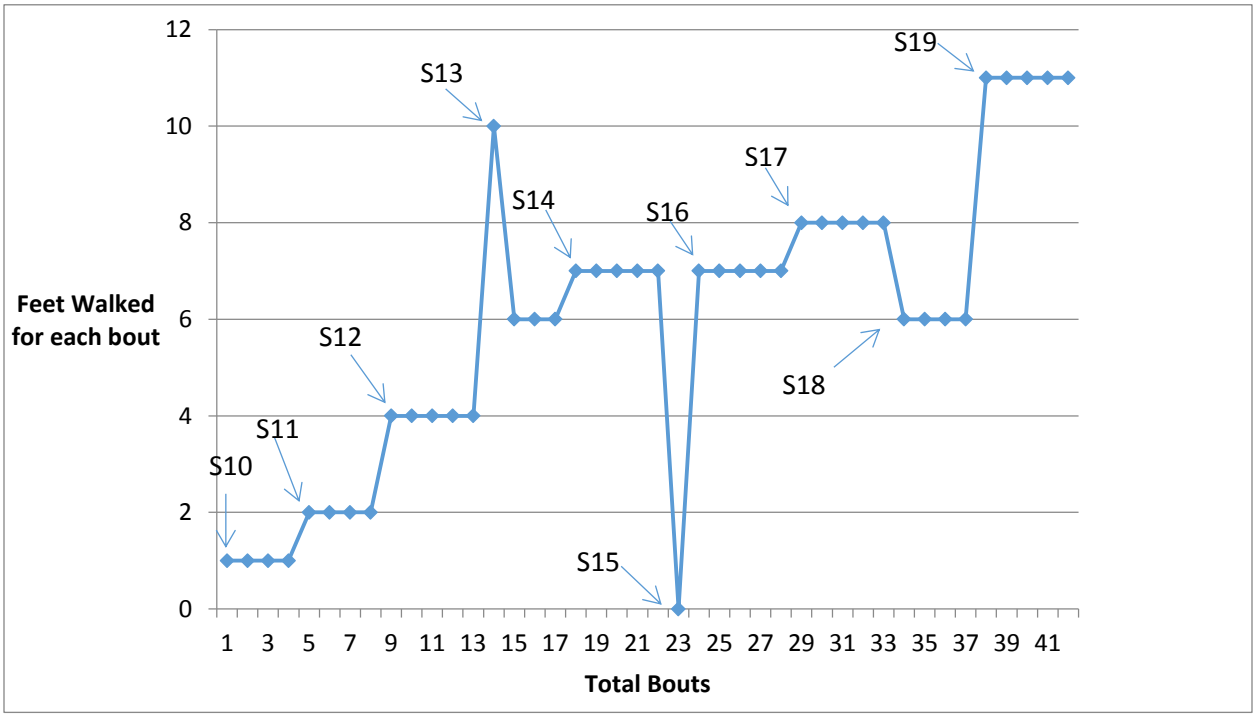
Aerobic Activity

Due to the patient's decreased activity tolerance to minor mobility tasks, aerobic activity was implemented via the Omnicycle™. The Omnicyle™ is a special therapeutic exercise system that is powered through rotations from bilateral upper and lower extremities. The patient would complete 15 minutes using her arms followed by 15 minutes using her legs to increase her aerobic capacity.

Gait Training

Given the patient's goal to walk and her inability to stand or walk independently on examination, gait training was a primary focus for her plan of care during the second phase. The patient was unable to complete any gait activities prior session 10. Gait training was initiated using a rolling walking with moderate assistance of 1 person. See Figure 1 for progression of gait throughout the plan of care. For the purpose of this report, S stands for session. In a 2003 article, Manson et al demonstrated the importance of physical exercise for the prevention of cardiovascular disease in women reporting walking to be as efficient as vigorous exercise in preventing cardiovascular events.[24] The patient completed pre-gait activities prior to her taking her first steps. Pre-gait activities included weight shifting side to side and front and back, and standing unsupported with a rolling walker.

Figure 1



OUTCOMES

The patient's impairments improved yet she didn't fully meet all of her goals. Goals in the area of strength, measured by manual muscle testing, improved to 3+/5 in all muscle groups tested (see Table 2), 1 muscle grade below the goal. Goals in bed mobility, transfers and locomotion as measured by motor components of the FIM were partially met. The patient was able to ambulate with a rolling walker 11 feet with CGA of 1 person, transfer from the bed to a chair using the stand pivot technique with Mod A of 1 person, and get in and out of bed with Mod A of 1 person (see Table 3).

DISCUSSION/CONCLUSION

The goal of this case report was to describe the use of task-specific resistance training bedside on a deconditioned 80-year-old female. Following a treatment plan that focused on exercises and activities to increase independence with functional mobility and strengthening, the patient showed improvement in both areas evidenced by MMT and tracking functional mobility in bed mobility, transfers and gait using the FIM guidelines. Previous research has shown that older adults can respond positively to exercise training.[25,26] In one study by Coleman et al, researchers evaluated the changes in strength, mobility, balance, endurance, frailty and quality of life following a 6-week multidisciplinary inpatient rehabilitation program. Therapy consisted of a variety of interventions aimed at improving balance, functional exercise capacity, lower limb strength, mobility and transfers.[25] Outcome measures demonstrated significant improvements in balance, basic functional mobility of sit to stand, walking, and changing directions with walking, and functional exercise capacity.[25] However, the patient was unable to fully meet her goals of achieving independence with gait, bed to chair transfer and bed mobility.

Currently, there is minimal literature on the effectiveness of bedside rehabilitation in patients seen in a skilled nursing facility. In addition, minimal literature reports the effectiveness of bedside rehabilitation in deconditioned patients or the effectiveness of specific reconditioning

interventions in rehabilitation.[2] There is currently insufficient evidence to support the use of geriatric rehabilitation programs to reduce functional decline in older adults who are deconditioned.[2] Moreover, there is a limited number of randomized controlled trials to assess and determine the most effective and efficient interventions to minimize and treat deconditioning.[2,27] This could be due to the fact that the term 'deconditioning' is not recognized by the International Classification of Diseases nor is it included in the National Library of Medicine Medical Subject Heading.[2] These exclusions may impact the ability to fund treatment programs and conduct research to determine the effectiveness of interventions to treat deconditioning.[2]

Alexander et al, 2001, utilized a randomized controlled trial to determine the effect of task-specific resistance training program to improve the ability of disabled older adults (age 65 and older) to rise from a bed to a chair.[7] Their findings indicated positive outcomes reporting increased overall ability to perform a series of bed- and chair-rise tasks. Consistent with the current case report, the patient increased her overall ability of transferring into and out of a chair or bed. Research regarding the effectiveness of gait training was plentiful. Researchers in a 2013 study investigated the effects of a walking program on aerobic endurance and function in a sample of sedentary elderly people.[28] The interventions consisted of walking training including balance exercises and lower limb strength activities.[28] The study concluded that a walking training program can be used to improve physical

functioning among sedentary elderly people.[28] There is minimal research on the effectiveness of gait training when confined to a room. The patient demonstrated increased strength and improved activity tolerance allowing for increased gait distance, ambulating with her rolling walker 4 feet at the 10th session to 11 feet, 5 times at discharge, with decreased assistance from the PT, Mod A at session 10 to CGA at discharge. The patient did, however, experience setbacks. On session 15, the patient was unable to complete any gait due to overactive bowel movements. On session 18, the patient decreased the number of bouts and the distance walking for each bout. This may be due to the intensity of the previous days' exercises.

The patient improved her strength and aerobic capacity as demonstrated by increased muscle grades and requiring less rest breaks during exercise with the omnicycle™ respectively. An article by Izquierdo et al investigated the effects strength, endurance and concurrent training had on the elderly.[21] It was suggested after an analysis of a 16-week program of the strength training group, the endurance group and the concurrent group that a minimum weekly frequency of concurrent training may promote an optimal stimulus to strength gains in previously untrained elderly subjects.[21] Additionally, a review article of the same topic concluded that the combination of strength and endurance training (i.e., concurrent training) performed at moderate volume and moderate to high intensity in elderly

populations is the most effective way to improve both neuromuscular and cardiorespiratory functions.[21]

Limitations: The data is this report is from a single subject who was confined to their room to complete interventions. Replication of this study should compare treatment with a control subject who receives the same treatment in a gym setting. The treatments utilized were appropriate for our particular patient and should not be generalized to all hospital-associated deconditioned patients. There is a broad spectrum of symptoms in older adults who become deconditioned following an acute hospital admission and should be treated appropriately based on examination findings. Severity of their condition can make a significant difference in rehab potential. In a patient with mild deconditioning, impairments may resolve more rapidly when compared to a patient with more severe and involved deconditioning such as in this case report. Additionally, the restriction of performing all interventions in the patient's room may negatively affect a patient who is more ambulatory because it would limit the amount of distance they are able to walk.

When the patient was initially examined, she was unable to perform basic mobility tasks. Possible weakness of the functional data accrued involves the reliability of recording a portion of the motor component of the FIM. Another weakness of the data involves recording gait distance during gait training. Step length, stride length, cadence and were not assessed.

The physical therapy interventions designed for this patient to address strength, activity tolerance, and functional mobility were effective to a degree. Although the patient was not able to achieve her goal to independently walk with her rolling walker, she was able to accomplish increased gait distance with decreased assistance from the physical therapist demonstrating the potential to continue to improve with the home exercise program and assistance from her daughter.

In conclusion, this is an important time regarding healthcare resources for older people status post-acute hospital admission, as the geriatric population is steadily growing.[25] There is a need for evidence based practice in the form of randomized controlled trials to determine the most effective types of therapy interventions would be beneficial to refine intervention options for patients with this condition.

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