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Hospital Acquired Deconditioning in a 78-year old individual: A Case Study

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HOSPITAL ACQUIRED DECONDITIONING IN A
78-YEAR-OLD INDIVIDUAL: A Case Study

by

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Bachelor of General Studies
University of North Dakota, 2019

A Scholarly Project Submitted to the Graduate Faculty of the

Department of Physical Therapy
School of Medicine and Health Sciences

University of North Dakota

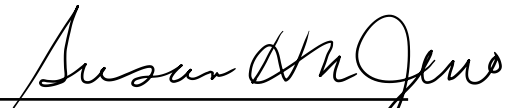
in partial fulfillment of the requirements for the degree of

Doctor of Physical Therapy

Grand Forks, North Dakota
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This Scholarly Project, submitted by Brooke Rehm in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.


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ABSTRACT

Background and Purpose: Physical therapy management of older adults following hospitalization is common. Patients tend to show impairments such as generalized weakness, decreased endurance, impaired mobility and gait, and an increase in dependence on others to complete activities of daily living. The purpose of this case study is to examine the physical therapy implications of treating patients with hospital acquired disability. This paper outlines the management of a patient who was newly admitted to skilled nursing facility, following a proximal humeral fracture. **Description:**

Following her stay at the hospital, the patient was discharged to the skilled nursing facility for short term rehabilitation. She presented with decreased strength, impaired mobility, impaired balance, decreased ROM, and a decreased desire to participate in rehabilitation. On evaluation, she was argumentative and did not want to participate in the examination. **Intervention:** Treatments for this patient included therapeutic exercise, therapeutic activities, gait training, and neuromuscular re-education. A series of supine strengthening exercises and transfer training were initiated to improve and progress strength and function. Occupational therapy completed care for her upper extremities.

Outcomes: Following physical therapy intervention, the patient improved her function, increased strength, motion, and distance ambulated, decreased assist in transferring, and a positive attitude towards rehabilitation. **Discussion:** Treatment was based on the facility's protocol on new admissions, clinical based articles, and the patient's presenting symptoms. Interventions were altered based on the patient's daily response to therapy and

health status. The patient was able to progress from almost fully dependent, to needing supervision with transfers. Due to an orthopedic appointment to clear her for weight-bearing status being delayed, the patient was not discharged as soon as expected from short-term rehabilitation. Due to this, the full extent of the patient's discharge status was unknown. The patient and the family planned on returning home on discharge.

CHAPTER I

BACKGROUND AND PURPOSE

Introduction

Physical therapy management of older adults following hospitalization is common. Patients tend to show impairments such as generalized weakness, decreased endurance, impaired mobility and gait, and an increase in dependence on others to complete activities of daily living (ADL). This phenomenon can be referred to as hospital-acquired deconditioning (HAD). Hospital-acquired deconditioning is a physiological change a patient may experience from a prolonged period of bed rest, inactivity, or a lifestyle deemed sedentary while in a hospital environment.¹ A similar term to HAD is Hospital associated or acquired disability. This means a patient will be unable to complete one activity of daily living (ADL) without assistance, in order to live independently.² A basic ADL could be transfers, bathing or dressing, eating, or a form of ambulation². These circumstances result in physiological changes in the body.

The relative decrease in activity effects the homeostasis of the human body. Inactivity and bed rest, nutritional deficits, and sleep disturbances that result from the hospital environment contribute to the failure of the homeostatic mechanism in the human body that leads to adverse health effects that may result in rehospitalization.¹ Hospitalization puts older patients at increased risk for new or worsening conditions and disabilities with a higher incidence of inability to recover from disability.³ This could

lead to a decline in muscle strength or mass, a decline in cognitive functioning, and/or diminished physical functioning that results in inability to participate in ADLs.¹ Although there is not one specific cause to HAD, there are several impairments that can contribute and make an older adult more vulnerable to it. These vulnerabilities change on a patient to patient basis and may include comorbidities, previous hospitalizations or illnesses, cognition, and psychosocial aspects of the patient's life.² The cause of this patient's hospitalization was a humeral fracture.

Prevalence of Proximal Humeral Fracture

The glenohumeral joint is a ball-and-socket type joint with numerous planes of movement.⁴ The joint is made up of the glenoid fossa of the scapula and the head of the humerus. Because the fossa is 1/3 of the size of the head for increased range of motion, the joint is not as stable as other ball-and-socket joints.⁴ On average, about 82 per 100,000 people per year will have a proximal humeral fracture.⁵ With the majority being female, the age 70-79-year-old population is more at risk of a fracture.⁵ In osteoporotic elderly patients, a proximal humeral fracture is the third most common type of fracture, following wrist and hip fractures.⁵ Falling from a standing height was the most common mechanism of injury resulting in a proximal humeral fracture.⁵ More than half of fractures occur in the left shoulder.⁵ Comminuted fractures, a break in the bone in two or more fragments, is more common in females compared to males.⁵ The most common method of treatment for a proximal humeral fracture is in a sling. A resulting prolonged hospital stay may result in deconditioning.

Prevalence of Hospital Acquired Deconditioning

According to Loyd³ in “Prevalence of Hospital-Acquired Disability,” there is a 30% prevalence rate of HAD of those hospitalized in an acute care setting (2020).

Additionally, 1/3 of adults over the age of 70 years of age may develop HAD even if the illness they were admitted for was treated successfully.² Approximately one-third of older adults that are hospitalized could be at risk for developing this weakness and/or increased mortality risk after leaving the hospital.³ The number of cases is likely to rise due to the increases in the older population as well as time spent bedridden.³

During an acute hospitalization, most time is spent immobile. Approximately 83% of the patients’ time in a hospital is spent in bed and 12% of their time seated or reclining in a chair.¹ Physiological capacity and functional reserve, or the body and organ’s ability to perform physical tasks and functions easily, may determine an individual’s susceptibility to being deconditioned in measures such as aerobic capacity or muscle strength.⁶ Sarcopenia, or age-related decrease in muscle mass, is recognized as a potential risk factor in functional decline.⁶ Older adults are therefore at an increased risk because physiological function and functional capacity decline with age.⁶ Prior to discharge from the hospital, about 68% of patients will not be at prior level of function¹ and following a year after discharge, fewer than half returned to prior level of function.² Among older patients in hospital setting, 50% of disability is a result of being hospitalized.² Due to these alarmingly high numbers, 1 in 5 Medicare beneficiaries will be re-admitted to a hospital following a hospitalization within 30 days of being discharged.¹ A reason that a patient may be re-admitted may be due to a fall.

A literature review showed that the etiology of HAD is unknown but there are several common etiologic factors. Bed rest as a result of medical or surgical illness, baseline physiological and functional reserve, and nutrition prior to admission and during admission play a large part in the decondition process.⁶ Comorbidities of decondition are cardiovascular conditions, cancer, chronic renal insufficiency, and chronic obstructive pulmonary disease.⁶ Anemia, pain, sleep deprivation, and depression can also contribute to functional decline and HAD.⁶ Multiple conditions can lead to lower prognostic outcomes.

Hospital acquired deconditioning can have an insidious onset that can rapidly progress and develop over a period of a few days.¹ Older adults are more susceptible, losing 1 kilogram of lower extremity lean tissue than their younger counterparts at 650 grams.⁶ With muscle atrophy comes decreased function. Older adults who are diagnosed with diminished function are 3 times more likely to be readmitted to a hospital within 30 days than older adults with other medically complex conditions and higher physical function.¹ This is because older adults have lower physiological capacity and functional reserve.¹ Another prognostic factor of HAD, functional deficits, is a strong predictor of hospital readmission, institutionalization, and mortality¹ which is common to see in HAD. Like HAD, intensive care unit (ICU) acquired weakness can result in functional deficits.

Intensive care unit acquired weakness is defined as patient that was admitted to the ICU for a variety of reasons that developed weakness.¹⁷ Intensive care unit acquired weakness commonly results from sepsis, acute respiratory distress syndrome, or mechanical ventilation in 4-7 days.¹⁷ Like HAD, there is no clear diagnosis

and no clear physical therapy (PT) management.¹⁷ Cognitive function correlates with worse physical function, quality of life, and activity limitations can last years.¹⁷

Prevalence of Falls in Elderly

In 1987, a falls prevention group defined a fall as unintentionally going to the ground that was not a result of a violent blow, loss of consciousness, sudden onset of paralysis, or epileptic seizure.⁷ Since then, the definition has become broader to include postural hypotension and transient ischemic attacks, as well as indicating falls are not solely random events taking place.⁷ The only way to determine the exact epidemiology and incidence of falls is to gather self-reported data from patients, making data skewed if the patient does not report a fall. It is estimated that about one third of people over the age of 65-years-old will have one or more falls in a year.⁸ A fall pattern, falling more than once with the same underlying risk factors, demonstrated that those falling tended to have a functional disability, impaired mobility, use of an assistive device, depression, lower mental test scores, or need more professional support.⁸ In women, functional disability, walking aids, and lack of support were the most effective in predicting falls.⁸ This means, for women, a fall pattern was demonstrated if they had a functional disability, used any type of walking aid, or did not have outside help with ADLs. The rate of falls in women to men is 2.7:1.⁹ When asking patients to report what caused their falls, 53% tripped, 19% were unable to recall, 8% reported dizziness, and 6% claimed they blacked out.⁹ The factors found to influence a fall include hypnotic or antidepressant medications, diminished handgrip strength, arthritis, and foot difficulties.⁹ Other risk factors for falls include previous falls, recent discharge from a hospital, cognitive impairments, diabetes, and weak muscles.⁷

Anatomy

Adverse effects following bed rest and immobility can result in skeletal muscle atrophy, decreased muscle endurance, and strength.⁶ The lower extremities are more affected than the upper extremities, and the extensors are more affected than the flexors.⁶ Extension results as a limb or body part being straightened out, whereas flexion occurs at a joint when it is bent. A group of hip extensors referred to as the hamstrings, is a group of three muscles, including semitendinosus, semimembranosus, and biceps femoris.⁴ The gluteal region also assists in extending the thigh, can stabilize the pelvis, and prevent pelvic drop, consisting of the gluteus maximus, medius, and minimus.⁴ The main leg extensor targeted is the quadriceps muscle, which is a group of four muscles: rectus femoris, vastus lateralis, vastus medialis, and vastus intermedius.⁴ These muscles work together to assist in the function of the core.

The lumbopelvic-hip complex, or core, provides stability, can prevent buckling, and return the body to equilibrium.¹⁰ The main muscles that contribute to the core are the abdominal and spinal musculature. These muscles include the rectus abdominis, transverse abdominis, external and internal obliques, quadratus lumborum, erector spinae, and multifidus.⁴ Alone, these muscles have specific actions, but acting together, can provide stability for the core.⁴ Core stability has been shown to improve lower extremity function, prevent injury, and offer postural support.⁴ These muscles can be evaluated by strength testing or strengthened through intervention.

Evaluation Techniques

A form of strength testing for older adults is a gross muscle strength assessment. This does not involve manually testing each individual muscle but uses functional

movements to determine the individual's strength or mobility. This method can be a useful tool because maintaining lower body strength increases functional ability in the later years.¹¹ Three tools have been shown to be valid and reliable and are available to be used as a part of diagnosing HAD: The Timed Up and Go Test (TUG), the Short Physical Performance Battery (SPPB), and the De Morton Mobility Index (DEMMI).¹² The TUG is classified as a point in time measurement tool, rising from a chair, walking 3 meters, turning, walking back, and sitting down.¹² This assessment is a simple tool that measures transfers, static and dynamic balance, gait, and turning.¹² The SPPB is a point in time instrument that measures the patient's ability to overcome daily movement challenges.¹² These tasks include a five time sit to stand, balance, and walking.¹² The DEMMI is another point in time tool that measures 15 mobility items at increasing difficulties.¹² The article determined no one test can be used alone and an accurate diagnosis is best determined by completing a full evaluation. The post-test probability of ruling in a fall at 35-40 and 40 seconds and beyond was 75% and 71% respectively.¹³ There is a strong relationship between a patient's strength and their falls efficacy.¹⁴ Therefore, it is important to assess fall risk to not only determine the patient's likelihood to fall, but the patient's perception, likelihood of an injury, and strength. The 30-second sit-to-stand is a reliable and valid test that indicates lower body strength and function.¹¹ This tool is quick to perform, does not require much equipment, and resembles a daily task. The reported values for interrater reliability and test-retest reliability are 0.737 and 0.987 respectively.¹¹ The 30-second sit-to-stand has high interrater reliability, test-retest reliability, and has concurrent validity to with the Berg Balance Scale, which is an established outcome measure for reporting balance.¹¹

A final method of evaluation a patient's strength and mobility was updated in the patient-driven payment model (PDPM). On October 1, PDPM for the skilled nursing facility (SNF) was implemented as the new case-mix classification for billing and reimbursement.¹⁵ Previously, Resource Utilization Group (RUG) levels were assigned to a patient based on their ADL or function scores that were calculated and put into a coded file known as section GG.¹⁵ Under PDPM, the items are replaced with functional abilities and goals and will be known as section GG that provide a resident classification score that is used to standardize and provide more detail on the patient.¹⁵ Physical therapy and occupational therapy (OT) will utilize this method of classification to measure mobility and self-care items.¹⁵ Through data collection, it is determined that section GG is a valid and reliable source to determine a patient's functional abilities.¹⁵

Patient Behaviors

A difficult patient describes a two-way relationship between the patient and his or her medical professional.¹⁶ Attributes of a difficult patient are behaviors, multiple physical problems, poor communication, and underlying psychosomatic or psychiatric problems.¹⁶ Passive, dependent, aggressive, and unrealistic patient expectations were listed as problems relating to difficult management of patient care.¹⁶ Another trait that may cause problems is the dependency on a single therapist.¹⁶ Strategies identified to deal with difficulties are providing explanations of the treatment plan, expectations, diagnosis, and timeframe for healing.¹⁶ Demonstrating active listening and adjusting one's manner and approach to gain rapport and patient confidence, honesty, and offering a counseling role have shown to help.¹⁶ Lastly, making the patient an active member in the process,

providing positive reinforcement and setting goals with the patient are behavior modifications that can ensure better communication with the patient.¹⁶

Purpose

The purpose of this case study is to examine the PT implications of treating patients with HAD. Currently, there is a large gap in knowledge on the topic in diagnosis and in treatment of HAD. According to “Rehabilitation of Hospital-Associated Deconditioning,” there is limited amount of research of patients with HAD.⁶ In 2009, there was no International Classification of Diseases (9th Revision) code (ICD-9 code) or a National Library of Medicine Medical Subject Heading term (MESH term) for hospital associated deconditioning.⁶ A search was completed on June 9, 2020 on the 10th edition of ICD and MESH term, resulting in no code or term or hospital acquired deconditioning, disability, or weakness. Alternate diagnoses for HAD include debility, muscle wasting, malaise, and generalized weakness.⁶ There is no consistent terminology for this condition. Terms have been used as hospital-acquired deconditioning, hospital-associated deconditioning, hospital acquired weakness, and ICU acquired weakness.

The ambiguity and lack of uniformity is leading to a gross undertreatment of patients following prolonged stays in hospitals. Therefore, failing to recover functionally following a hospitalization is a very common and potentially dangerous phenomenon. It can be addressed by physical therapists during and following the patient’s hospital stay in order to return the patient to prior level of function, to prevent re-admittance, and increase independence. Current treatment has traditionally included general conditioning activities like simple ambulation of a hallway without applying skilled treatment, nonspecific range of motion, or exercises applied at a therapeutic intensity (low intensity)

that is not beneficial to the patient.¹ These therapeutic interventions do not combat the adverse effects of bedrest and do not adequately target physical limitations and impairments due to lack of specificity and intensity. Emphasis should be placed on high intensity resistive training in order to target ADL performance, lower body strength, and gait speed.¹ Clinical application of high intensity (70-80% 1 rep max) can be achieved by muscle fatigue at 8 to 12 repetitions with deterioration of form over the last 2 repetitions or a rating of perceived exertion of 15-17 on the Borg Rating scale of 6-20.¹ A one-repetition maximum (1RM) is the amount of force a person generates to complete maximum contraction. The Borg Rating Scale is subjective method used to determine how much work a patient feels is being done. The scale begins at 6 with very, very light work and goes up to 20, demonstrating maximum effort.¹ Aerobic training, exercise that is meant to increase circulation of oxygen, should be included as a part of a program involving higher resistive training to contribute to better physical performance in older adults.¹ Examples of this include brisk walking, running, swimming, and biking. Exercise can help to return a patient to their prior level of function, as well as to help combat any comorbidities that the individual may have.

Screening criteria for patient selection

The patient met the inclusion criteria to work with PT as she was medically stable. She was referred to PT by a physician and was agreeable to participate in therapy sessions. The patient was a skilled admit in a SNF, which qualified her to have rehabilitation by PT and OT 5 days a week. Vitals, weight, and medication delivery was completed and monitored by nursing staff and updates on the patient were checked daily to see if the patient was not appropriate to work with the rehabilitation team. A thorough

evaluation was completed to assess the entirety of the patient's abilities and limitations to develop a plan of care. This case study will look at the PT management of a patient with a proximal humeral fracture following a prolonged hospitalization.

CHAPTER II

CASE DESCRIPTION

History

The patient was a 78-year-old female who fell and broke her arm in late October, 2 weeks prior to admission to the hospital, and was referred to the SNF for short-term rehabilitation following a four day stay at a hospital. The medical diagnosis for the patient was presented as a displaced comminuted fracture of the right proximal humerus. After going to the bathroom with her four-wheel walker (4WW), she fell and broke her arm. She recalled no dizziness at the time of fall, as well as nothing on the ground to make her trip. It was unclear as to how she fell, as she did not recall anything significant happening.

An evaluation was completed in her room at the SNF. On entering the room, the patient was argumentative, aggressive, and uncompliant with all staff members. Her chief complaint was wanting to leave the facility and get home, due to fear of her money being taken from her while staying there. The patient had a secondary complaint of pain and inability to move without feeling safe due to a fear of falling.

The patient had an extensive past medical history. This included history of congestive heart failure, atrial fibrillation, left (L) carpal tunnel syndrome, pelvic fracture, diverticulosis, cardiomyopathy, (L) anterior cruciate ligament tear, pressure ulcers, and a sacral wound. Current problem list included multiple medication allergies,

diabetes, asthma, chronic pain, gastrointestinal reflux disease (GERD), hypertension, polymyalgia rheumatica, spinal stenosis, peripheral vascular disease, metabolic encephalopathy, and osteoarthritis in multiple joints. Diabetes, peripheral vascular disease, GERD, hypertension, and osteoarthritis were the comorbidities that were more current, with special cautions for rehabilitation. A full list of medications was not obtained for this patient from therapy and was managed by nursing staff. She displayed underlying signs of paranoia. These signs included believing others have ulterior motives, hypersensitivity to criticism, trouble working with others, quick to anger and hostility, and being argumentative and defensive.¹⁸

Due to the extensive medical history of this patient, caution was used when working with her and clinical judgment was used to routinely monitor signs and symptoms. With diabetes, hypoglycemia and hyperglycemia are potential complications. Signs of hypoglycemia are shakiness, dizziness, sweating, hunger, and a pale look to the skin.¹⁸ Hyperglycemic signs include shortness of breath, fruity smell to breath, and dry mouth.¹⁸ Skin checks, impaired balance, and claudication are important indicators for both diabetes and peripheral vascular disease. Due to the patient having asthma, monitoring her breathlessness was important to prevent further complications. A reverse Trendelenburg position was required for supine exercises due to GERD, as well as avoiding putting the gait belt over the stomach region and scheduling PT before meals, instead of after meals. With the patient's history of hypertension, monitoring for dizziness, shortness of breath, fatigue, and cognitive changes were necessary, as these are signs of increases in blood pressure.¹⁸ Contraindications to exercise include decreases in systolic blood pressure of more than 10 mmHg, resting systolic blood pressure of more

than 180 mmHg, and resting diastolic blood pressure of more than 110 mmHg.¹⁸ Lastly, with arthritis, no high impact activities were warranted, which can aggravate pain and cause inflammation.

Prior to her stay in the hospital, the patient lived at home in the countryside of Minnesota. Her son cooked her meals and took care of her laundry. Her granddaughter was her primary caregiver and helped with toileting and showering. Socially, she did not leave the house often. This was reflected in the nursing home by not participating in group activities often. She used a 4WW at home for short distance ambulation. She was able to complete transfers and bed mobility with the assistance of her walker. For the time being, she was living in a short-term rehabilitation room in the SNF. Previously, she received some PT while staying in the hospital for treatment of her proximal humeral fracture. The patient and family's goal was for her to return home with the same abilities she had before the fracture, to continue with the amount of care the family provided, without having to pay for more help. Due to the patient being a skilled admit into the SNF, she was a candidate for PT. The examination plan was based on the required section GG mobility section.

Examination and Evaluation

Upon initial evaluation, the section GG was completed as part of the new guidelines for PDPM. To summarize, the patient was dependent or maximum assist of 2 on most ADLs involving mobility. Table 1 shows the complete mobility portion of section GG completed by PT and nursing staff over her first three days at the SNF. The section GG is part of the payment driver of the SNF and is mandated, therefore does not require a reliability and validity study to support its use. The SNF had OT working with

upper extremities and PT working with lower extremities for short-term rehabilitation patients, for this reason, upper extremity tests and measures were deferred to OT.

Table 1. Section GG – Initial Evaluation

<u>Activity</u>	<u>Assist</u>
Roll Left and Right	2 (MaxA*)
Sit to Lying	1 (Dependent)
Lying to sitting	1 (Dependent)
Sit to stand	2 (MaxA*)
Chair/bed to chair transfer	1 (Dependent)
Toilet Transfer	1 (Dependent)
Car Transfer	88 (N/a safety)
Walk 10 feet	1 (Dependent)
Walk 50 feet with 2 turns	1 (Dependent)
Walks 150 feet	1 (Dependent)
Walking 10 ft on uneven surfaces	1 (Dependent)
1 step (curb)	9 (N/a)
4 steps	9 (N/a)
12 steps	9 (N/a)
Picking up an object	88 (N/a safety)
Wheelchair Management	9 (N/a)

MaxA* = Maximum Assistance, N/a = not applicable, ft = feet

Her pain levels reached a level of 5 out of 10 at rest (0 being no pain and 10 being highest level of pain). She indicated the pain location was in her right shoulder and it was

a dull and ache type of pain at rest and the pain came on with movement was a 4 out of 10 pain and also a dull ache in the same location. She did not have any limitation from her pain. A skin check was completed by checking lower legs and feet, with no open sores found on her legs. A gross muscle screen was completed by observing functional movements like transfers that are included in the section GG. During transfers, she appeared to have a “tabletop” type posture. This is described as bent over at the hips, leaning over a walker so that her thorax was parallel with the ground. She was unable to move her right arm due to being in an immobilizer, limiting her range of motion. Because she was in a wheelchair, her legs were moved passively to determine if she had any contractures and were considered normal. Active motion appeared equal on both legs.

Four weeks into treatments, the patient was strong enough to complete a modified TUG as well as a 30 second sit to stand. The patient used a hemi cane in her left hand as a modification and required minimum assist of 1 to stand. The results are recorded in table 2.

Table 2. Outcome Measures - Initial

Timed Up and Go (TUG)	1: 34 minutes
30 second sit to stand	2 sit to stands

For this case, the TUG was used to show improvement not only for the therapy staff, but to show the patient how well she was doing. This patient benefitted from positive reinforcement and feedback in order to maintain high levels of participation in PT. She was able to complete a modified version of the TUG using a hemi cane in her L hand with contact guard assist. Clinically, this patient qualified to complete this

intervention for measuring progress and current level to address future interventions, as well as a feedback tool to facilitate further therapy buy-in.

The 30-second sit-to-stand is a practical tool for use in the geriatric population with lower level of lower extremity function. Prior to hospitalization, the patient was able to complete sit-to-stands using a 4WW. Near the end of the episode of care, the patient was able to complete sit-to-stands with minimum assistance and cueing. As stated above, the patient benefited from the feedback mechanisms to show her progression to increase buy-in. This tool further facilitated that buy-in, as well as was used to measure functional strength to return home on discharge. A final use of the 30-second sit-to-stand, as indicated in the article, is a comparison to the Berg Balance Scale as a means of measuring balance.¹¹ The patient fell and broke her arm, so this tool further assessed her ability to return home without a future fall.

Due to this patient being in a nursing home with full attention from nursing staff, a full systems review was not completed by PT staff. Updated systems review check-ins were completed multiple times a day and were reviewed by therapy staff. The patient's diabetes and hypertension were closely monitored by nursing staff, as well as signs and symptoms monitored during PT sessions with the patient. The patient's oxygen saturation was monitored with activity to stay above 90% during PT sessions. A skin check was completed on evaluation to cover the integumentary system, as well as continuous skin checks by nursing and throughout therapy sessions. Due to being unable to ambulate or stand for more than one minute on evaluation, a full neuromuscular check was not done by PT staff.

To summarize evaluation findings, the patient required a maximum assist of 2 people or was completely dependent on almost all aspects of mobility. She displayed signs of paranoia and unwillingness to participate in PT. Her extensive past medical history was an important piece of information that had to be accounted for with therapy sessions. She was well below her prior level of function and desired to be discharged home. Her condition was acute, as her weakness resulted from being in a hospital, but her mental health was a potential prohibitor to returning to prior level of function. The patient's impairments included lower and upper extremity weakness, impaired gait and balance, impaired mobility, decreased upper extremity range of motion, and pain. The patient's activity limitations were bed mobility, transfers, ambulation, and prolonged standing. The problem list for PT to address was lower extremity weakness, diminished endurance, decreased functional mobility, and diminished balance putting her at a fall risk. With the problem list in mind, the patient was eligible for PT in order to increase independence and return to prior level of function.

Diagnosis

Due to the medical diagnosis provided by the physician being upper extremity related, and OT overseeing upper extremity pathologies, a diagnosis was still needed by PT. The patient had generalized weakness in her lower extremities as shown by the initial section GG. This led to a PT diagnosis of "Generalized Weakness" with an ICD-10 code of M62.81. This conclusion was drawn from the information that she was able to complete bed mobility, transfers, ambulation, and was not using a wheelchair prior to her stay at the hospital, as well as utilizing the TUG, and parts of SPPB and DEMMI that make up the section GG. The full SPPB and DEMMI were not used as most of the

outcome measures made up the section GG. This patient had obtained her weakness then from HAD. The hospital ruled out any severe diagnosis leading to her fall. The patient was educated on her medical history as a potential cause for her fall with many of her pathologies indicating dizziness, impaired balance, vision changes, or shortness of breath. A quick coordination screen was used to rule out a neurological condition that could have led to weakness in the lower extremities.

Prognosis and Plan of Care

Based on initial examination data, her prognosis was poorer than normal due to her behaviors but was changed to a good prognosis once the patient trusted staff and participated in PT, showing improvements in her function. The patient was expected to make a full recovery and return to prior level of function and return home in about 6 weeks. Another hinderance to her prognosis was her standing posture once staff could get her upright. She demonstrated a “tabletop” position and increased levels of scoliosis which could have played a major role in her fall. A positive prognostic factor was her family’s support and motivation to get home. This led to a revised course of action. Patient education played an important role with this patient. Focus was changed to completing therapy in a way where the patient could see how it would translate to returning home as well as building a trusting relationship that shared similar patient values to help the patient buy-in to therapy and increased her adherence to the program.

Two initial short-term goals and one initial long-term goal were formed. Short term goals were updated once they were met and progressed in function to move toward returning to home. The patient’s goals were as follows:

1. Following PT intervention, the patient will safely perform bed mobility tasks with minimum assist x 1 without use of bed rails in order to decrease level of care needed by caregivers and staff to progress to return to home. To be completed in 3 weeks. This goal was updated to complete with supervision instead of minimum assist of 1.
2. Following PT intervention, the patient will be able to use the hemi-walker with minimum assist x 1 for sit to stand transfers from the WC to the toilet to increase independence to return home. To be completed in 3 weeks. This goal was updated to the use of a 4WW and changed the level of assist to independence.
3. Following PT intervention, the patient will be able to complete transfers independently to return home. To be completed in 6 weeks.

The plan for re-examining this patient was important not only for PT and insurance funding, but for the patient to see her progress. This encouraged her to keep trusting therapy staff to meet her goal of returning home. The section GG was used as a re-evaluation tool, as well as a guide to therapy interventions. As of now, the section GG is used as a minimum data set for monitoring and may be applied as an outcome tool in the future. Due to the recent application of section GG, not enough data is available as an outcome measurement. The TUG and 30-second sit-to-stand were also used to assess progress for both parties. A final method of re-evaluation was consulting with to the patient herself on how well she felt she was progressing. Using the findings from the examination and evaluation, interventions were used to return the patient to prior level of function.

CHAPTER III

INTERVENTION

During the course of this patient's stay in the SNF, she was classified as needing skilled care that required admittance to this facility. The skilled classification required the patient to be seen by the rehabilitation team five days a week for 45-minute sessions each day, for 6 weeks. Coordination with occupational therapy and nursing was necessary to avoid scheduling conflict and allow the patient to receive the full benefit of skilled care. A white board was introduced into the patient's room with the scheduled time for PT to assist all caregivers in coordination of care. Nursing staff updated her chart throughout the day in order to keep all staff up to date on her current condition. Physical therapy and nursing communicated on level of independence and assist needed for transfers for each patient in the facility. Because the facility put OT in charge of short-term rehabilitation patient's upper extremity plans of care, communication was in place to be sure all goals were met for a functional discharge. For this reason, lower extremity strength training was targeted with exercises.

Lower extremity strengthening was the focus of intervention with her, whether that be through therapeutic activity to reorient the patient with transfer training, or through therapeutic exercise, targeting weak muscles. Strengthening of the lower extremities is associated with improvements in rising from a chair, transfers, gait, navigating stairs, and stooping.¹⁴ Because the patient was deconditioned from her stay at

the hospital and was now wheelchair bound, these ADLs were all areas that needed improvement. Data shows addressing impairments directly instead of completing generalized strength training will increase in function¹⁹, therefore most of the time spent with the patient focused on functional training. To ensure the patient was working hard enough to reap the benefits of the exercises, form deterioration on the last two repetitions was seen to indicate 70-80% 1RM was being achieved during an exercise.¹ Supine bed exercises helped the patient understand bed mobility, sit-to-stands encouraged the patient to transfer safer, ambulation in the hallway increased the patient's body awareness to increase perception in her stability. With a strong relationship between strength gain and falls efficacy¹⁴, this patient benefited from strength gain to have a better perception on her ability to not fall again after breaking her arm. This patient's prior level of function included walking, transfers, and bed mobility. Moderate intensity exercise improves gait stability, especially in the mediolateral aspects of stability.¹⁹ With this information in mind, patient education was planned and discussed with the patient for the plan of care.

Patient and family education were provided through the episode of care on the plan of care for PT sessions, their goals, and the discharge process in order to return home. She was educated on her non-weightbearing status on her right arm with the use of her brace and was informed that she will be getting a new brace in a few weeks that will allow movement of the lower portion of her arm. She was encouraged to use the call light to have the nursing staff help her in her room. Discussion of the use of an assistive device with the patient and family was completed for the patient to return home safely. Throughout therapy sessions, the patient is educated on the importance of participating in PT to get stronger to be able to go home like she stated in her goals.

Week 1

Due to limited use of her arms, she was transferred with a stand aid. Education and demonstration were used through therapeutic activity for stand aid use as the patient required moderate assistance of 2 people to transfer and was unable to use her right arm. The stand aid is a transfer device that has a grab bar for patients to use to pull themselves up that results in a decrease in the level of assistance needed to transfer a patient. She did not like to sit in a recliner and preferred to sit in her wheelchair, so therapy often started in her wheelchair. The patient was transferred from her wheelchair to the parallel bars utilizing the stand aid with moderate assist of 2 people. She was able to tolerate standing for three minutes before getting tired and requiring rest. This was completed a few times per session. Short bouts of ambulation consisting of a shuffled gait pattern for 3-5 feet were attempted throughout the week in the parallel bars. The patient refused to walk and required plenty of motivation, education, and encouragement to participate in the first week of therapy. Table 3 shows the progression of gait pattern and distance walked throughout the episode of care. Transfer training was also initiated in the patient's room on the first full day of treatment. Moderate assist of 2 people with the stand aid was required for transfers from the wheelchair to the edge of the bed and back and to the toilet and back. The patient required maximum assist of 2 people to complete bed mobility activities and get from seated to supine and back.

Therapeutic exercise was initiated to help promote functional strength to progress away from the use of the stand aid and to begin use of a hemi-cane. The Nu-step was utilized for endurance and muscle strengthening starting at level one. The patient completed this activity for 8-10 minutes each day, using only her legs. She required

Table 3. Gait Progression for Episode of Care

Week	Distance Ambulated	Assistance	Device used	Gait Pattern
1	3-5 feet	Mod x 2	Parallel bars	Shuffled and hesitance, decreased foot clearance
2	6-8 feet	Mod x 1	Parallel bars	Shuffled gait pattern
3	20-25 feet	Min x 1	Hemi cane	Shuffled gait pattern, requires closed environment
4	30-35 feet	Min x 1	Hemi cane	Able to participate in open environment
5	60 feet	CGA	4WW	Starting to initiate larger steps, requires cues to look up with ambulation
6	150 feet	CGA	4WW	Able to turn, look up, and avoid obstacles

Mod = moderate, Min = minimal, 4WW = 4 wheeled walker, CGA = contact guard assist

intermittent assistance to maintain foot placement on the pedals. Supine bed exercises were completed with the patient to start the foundation of her strengthening exercises in a semi-Fowler's position. This position was maintained by having the patient supine in bed with a wedge and pillows under her upper body, keeping her at a 30-45-degree angle. Exercises were completed in this position because the patient was most comfortable in this position, due to her posture, and to help avoid any effects of GERD. Ankle pumps, quadricep sets, heel slides, hip abduction, and short-arc quads were completed bilaterally on both lower extremities in a supine position. Table 4 shows a detailed progression of supine exercises throughout the patient's treatment. Ankle pumps are completed by moving the foot up and down, through the full range of motion. Quadricep sets were completed with the physical therapist's hand under the knee and cues to squeeze her thigh muscle to get her knee to push into the hand beneath it. Heel slides were completed by having the patient slide her heel up towards her bottom while maintain contact with the table. Abduction exercise was completed with the toes pointed towards the ceiling,

moving the leg out to the side, and returning it to neutral. Short-arc quads were completed with a bolster under the distal thigh, with cues for the patient to squeeze her thigh muscle to lift her foot off the table, while keeping her knee on the bolster.

Table 4. Supine Exercise Progression

Therapeutic Exercise	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Ankle Pumps	x20	N/a	N/a	N/a	N/a	N/a
Quadri-cep Sets	x10	N/a	N/a	N/a	N/a	N/a
Hip Abduction	x10	x20	x25	x20 (1#)	x20 (2#)	x20 (3#)
Heel slides	x10	x20	x20	x20 (1#)	x20 (2#)	x20 (3#)
Short-arc quads	x10	x20	x20	x20 (1#)	x20 (2#)	x20 (3#)
Hook-lying Marching	N/a	2 x 10	x20	x20 (1#)	x20 (2#)	x20 (3#)
Hook-lying ABD*	N/a	x10 (RTB)	x20 (GTB)	x20 (BTB)	x25 (BTB)	x25 (BTB)
Hook-lying ADD**	N/a	x10	x20	x20	x25	x25
Bridge	N/a	x10	x15	x20	x20	x20
SLR***	N/a	N/a	x5 (ModA)	x10 (ModA)	x10 (MinA)	x10
Low Trunk Rotation	N/a	N/a	N/a	x20	x20	x20
Hamstring curls	N/a	N/a	N/a	N/a	x20	x20

*ABD stands for abduction, ** ADD stands for adduction, ***SLR stands for straight leg raise, RTB stands for red theraband, GTB stands for green theraband, BTB stands for blue theraband, ModA stands for moderate assistance, MinA stands for minimal assistance, # stands for pounds, N/a stands for not applicable due to discontinuing exercise

Week 2

Therapeutic activity was utilized this week to start transfer training with a hemi cane used in the patient’s left hand. A hemi cane was chosen as the assistive device given to the patient due to her extreme kyphotic posture, weakness, and inability to use her right arm. Patient education and demonstration were used throughout the week to ensure safety, recall, and adherence. Transfer training was practiced from the wheelchair to the plinth, bed, and toilet. Assistance started with moderate usage of 2 people, but the patient was able to complete with moderate assistance of 1 when she became comfortable with the new device. Guarding was performed on the right side of her body. Education and demonstration were also used when the patient demonstrated unsafe sitting technique

such as plopping down on the chair, not reaching back for the arm rests, not looking where she was about to sit, and not touching the chair to the back of her knees. She worked on pivoting, soft sitting, scooting forward in the wheelchair before transferring, and reaching back before sitting to become safer. Transfer training was practiced bilaterally to ensure safety and confidence in herself. Strengthening was continued to maintain the progress being made to decrease assist level.

Therapeutic exercise was continued this week also. The use of a physical therapist assistant was used one day for the strengthening portion of the treatment and she completed seated exercises. Twenty repetitions of each exercise were completed bilaterally while the patient was seated in wheelchair. Hip flexion with a 3-pound weight placed above the knee was completed with cues to lift the knee as high as she was able. Long-arc quads were done with a 7-pound weight around her ankles with cues to kick her leg straight. Hamstring curls were completed with a green theraband with cues to kick her foot back towards her bottom. Abduction was also completed with a green theraband with cues to spread her knees apart. Plantarflexion and dorsiflexion were completed with cues to lift the toes up and lifting the heels up. Supine exercises were completed the rest of the week increasing reps and resistance where necessary. Refer to table 4 for the supine exercise progression. Hook-lying bridge, marching, abduction and adduction were added this week. The hook-lying bridge is completed by having the patient's hips bent to 45-degrees and the knees to 90-degrees. The patient then lifts her bottom off the table. Marching, abduction, and adduction are completed in the same position with knee lifts, spreading the knees, and squeezing the knees together, respectively. Quad sets and ankle

pumps were removed as the patient was getting stronger. A straight leg raise exercise was attempted, but the patient was unable to complete it.

Week 3

The plan of care was continued into week three with therapeutic activity with the continuation of transfer training with the hemi cane. With the increases in strength and confidence, the patient was able to practice transfer training in her room with minimum assistance of 1 person in order to complete ADLs, working towards independence. Sit to stands were a continued treatment in the plan of care, working on scooting forward in the seat and keeping her feet back. A new seat lift was added to her toilet to be able to increase the patient's independence and decrease the level of staff assistance. Gait training was initiated with the hemi cane with cues to pick up her feet to avoid the shuffling gait pattern. The patient ambulated in the hallway where there were less distractions and she was able to focus better on her form. She ambulated 20-25 feet before requiring a rest break. The patient expressed her concern for walking in front of staff as she felt they would not help her if they saw her walking. Patient education was completed on the use with the hemi cane with nursing. The patient was informed if she was to feel uncomfortable or unsafe, the patient can go back to the stand aid with nursing staff. Strengthening was completed to continue the plan of care to reach goals.

Therapeutic exercise was continued to progress strengthening in her lower extremities in order to further increase her independence for a return to home. Patient education about her progress and how it is getting her closer to going home was emphasized to encourage her. A new male physical therapist assistant was introduced to the patient. The patient had preferred working with females in the past, so the new

assistant was with the PT to build rapport and comfortability with the patient. The progression of supine exercises is continued in table 4. The hook-lying abduction exercise progressed to a green theraband. The straight leg exercise was trialed; the patient required moderate assistance bilaterally to initiate the movement. This was completed by having the patient squeeze her thigh muscle and lift her entire leg off the table. Moderate assistance was provided at her ankle to initiate the movement. Standing exercises were also initiated for functionality. At the parallel bars, the patient had left arm support and completed a marching activity with cues to lift her knees as high as she can, 8 times on each leg. Standing forward and backward leg kicks were also introduced with 10 repetitions each. Cues were used to avoid forward or backward leaning in order to get correct muscle activation. Standing abduction was also completed with the same cues and same repetitions. Lastly, 10 mini squats were trialed with the patient's wheelchair placed behind her for safety and for cueing to act like she was about to sit in the chair.

A progress note was completed this week and goals were updated to decrease assistance in order to return home. A care conference was also held this week with her sons and granddaughters. Caregiver education was provided on the patient's progress and her remaining deficits. A safe return to home plan was discussed and more home layout details were provided.

Week 4

The patient received her new brace during the 4th week of therapy. The new brace allowed her to have movement from her elbow down with a five-pound weight limit through her arm. Lengthy patient education was given to the patient about the new weight bearing status and the importance to not put more weight through the arm than necessary.

A scale was introduced to the patient as a biofeedback device to let her feel what five pounds felt like when putting weight through it. Signs were placed in her room for her reminder, as well as for nursing staff, to not weight bear through the arm for transfers. This new weight limit was utilized with activities in her room.

The patient continued to progress with therapeutic activities in therapy sessions. She expressed interest in gaining more independence with toilet transfers, so we continued to work on that aspect of her plan of care. With the use of the grab bars and her hemi cane, the patient was able to complete a toilet transfer with contact guard assist. She was able to stand in front of the toilet with supervision for one minute in order to decrease assistance for bathroom cares. Bed mobility was also reassessed and was improving by requiring moderate assist of 1 to get supine and moderate assist of 2 to get back to seated at the edge of the bed. Therapeutic exercise was continued with the patient and is described in Table 4. A low trunk rotation exercise was added by having the patient begin in a hook-lying position with a green theraband around her lower thighs. The PT would hold the band taught towards the right and the patient would rotate the legs to the left and vice versa. The patient ambulated 30-35 feet this week requiring a rest break after 15 feet. Her gait pattern improved, and she participated in the therapy gym with other residents in an open environment. At the end of week four, the patient completed a modified TUG and 30 second sit-to-stand for means of reassessment for strength and function. See Table 2 for results.

Week 5

With the patient's new weight bearing status in mind, the patient was educated on using a 4WW like she did before the fall in order to ambulate. The patient was educated

to not weight-bear through her arm, just using her right arm to steer and weight bear through her left arm. Demonstration and review were used throughout the session to ensure understanding. The patient ambulated 60 feet with the 4WW. An obstacle course was also set up this week to encourage the patient to keep her head up when walking to avoid another fall. The patient was able to demonstrate turning with the new assistive device. The patient demonstrated transfers from the wheelchair to the plinth with supervision. Therapeutic exercise was continued in supine with increasing resistance and repetitions. A supine hamstring curl exercise was performed using a swiss ball under her heels for core and hamstring activation. The patient was instructed to lift her bottom off the table, dig her heels into the ball, and pull it towards her. Balance activities were also initiated at this time. The patient initially refused these exercises, but compromise and patient education allowed the PT to work on her balance training to help the patient become aware to prevent falls. In the parallel bars, the patient completed eyes open and closed activities while standing on the floor and on a foam pad for 2 minutes each.

Week 6

Week six was originally supposed to be her last week in short-term rehabilitation. Due to unforeseen circumstances, her discharge date was moved due to her inability to see her physician for additional imaging. Review of transfers with limited use of her right hand were completed during PT. The patient was asked to recall her cues for transfers, brakes on her wheelchair, and safety information. The section GG was also completed again as a re-evaluation tool to look at progress and assess strength in a functional capacity. Transfer training was also completed in a soft chair to simulate a recliner that she has at home that she likes to sit in.

Therapeutic exercise was continued with increased repetitions and resistance. See Table 4 for the continued progression. Weights were increased to 3 pounds and the straight leg exercise was improved to minimal assistance required to raise her legs bilaterally. Manual tactile stimulation of tapping performed on the quadriceps while the patient engages the quadriceps was performed during the straight leg raise. Balance activities were continued in the parallel bars for safety. Perturbations were given for one minute with the eyes open and closed each, in all directions. Foot taps were also performed in all directions with one handed support. The patient was educated on the importance of these exercises to return to ADLs safely. The modified TUG and 30 second sit-to-stand were done again, checking for progress.

Reassessment was performed throughout all sessions by means of assistance needed, how she could progress in weights and in repetitions, how she felt after each session, and through outcome measures like the TUG, 30 second sit to stand, and the section GG. According to “A 30-s Chair-Stand Test as a Measure of Lower Body Strength in Community-Residing Older Adults,” the 30-second-sit-to-stand is a valid measure of assessing strength gains, is able to test a wide variety of ability levels, and can show similarities to a 1RM leg press machine.¹¹ Supine exercises were preferred over standing and seated exercises because the patient enjoyed completing them and asked to do them during every session because she felt they were what was getting her stronger so she could get home faster. Other balance exercises were not completed due to the patient refusing to continue with them, even with patient education and compromising techniques. Goals were directed at returning to prior level of function and the patient’s goal to return home.

Patient education was an important piece for this client. The patient was often argumentative and refused to participate in PT. This patient required special attention and care before, during, and after every session. The main strategy used was to provide explanations of the process, treatment, expectations, and how it related to patient goals.¹⁶ Others included active listening, adjusting manner to build rapport and confidence, honesty, counseling, and making the patient an active participator in her therapy sessions.¹⁶ The patient responded well to these strategies and quickly began to trust therapy staff and be willing to participate in PT each day. Therapeutic activity, exercise, patient education, and modifying behavior to meet the patient's needs demonstrated great outcomes.

CHAPTER IV

OUTCOMES

At the conclusion of the planned six weeks of therapy outlined in her plan of care, she was close to meeting all short-term and long-term goals. Due to her scheduled appointment being unattended, the patient's right arm was not cleared for full weight bearing. Because of this, the patient was unable to be discharged home like originally planned. The long-term goal of returning home in 6 weeks was not met. The patient was able to meet all short-term goals, except her level of assist for toilet transfers was classified as supervision on the last day of therapy due to her being unable to fully weight bear in her right arm. Table 5 outlines the section GG that was completed prior to discharge. The patient improved from maximum assist or full dependence on transfers and ambulation as seen in Table 1 to independent or supervision for mobility ADLs. A re-evaluation of the section GG was used to reassess the patient's ability to return to home, return to prior level of function, and as a means of improvement of strength.

She reported minimal to no pain in her upper and lower extremities during her sixth week of PT. A skin check was completed again with no signs of open sores or wounds found during this inspection. She maintained functional range of motion with no contractures occurring throughout her stay at the SNF. Oxygen saturation (>90%) and RPE (15-17) were always monitored and kept in safe ranges. The patient was able to stand with supervision for more than five minutes, while keeping her distracted,

compared to her initial stand time of under one minute. At the time of the final evaluation, the patient was able to weight bear five pounds through her right upper extremity, completed range of motion activities, and began initiating strength training below 90 degrees. Outcome measures were further used to assess progress.

Table 5. Section GG – Final Evaluation

<u>Activity</u>	<u>Assist</u>
Roll Left and Right	6 (Independent)
Sit to Lying	6 (Independent)
Lying to sitting	6 (Independent)
Sit to stand	6 (Independent)
Chair/bed to chair transfer	6 (Independent)
Toilet Transfer	4 (Supervision)
Car Transfer	3 (Partial-ModA)
Walk 10 feet	4 (Supervision)
Walk 50 feet with 2 turns	4 (Supervision)
Walks 150 feet	4 (Supervision)
Walking 10 ft on uneven surfaces	4 (Supervision)
1 step (curb)	9 (N/a)
4 steps	9 (N/a)
12 steps	9 (N/a)
Picking up an object	88 (N/a safety)
Wheelchair Management	9 (N/a)

ModA= Moderate Assistance, ft = feet, N/a = not applicable

The Modified TUG and 30-second sit-to-stand were outcome measures that were also completed for reassessment of strength and function. The patient's initial scores can be found in Table 2. The patient initially used a hemi cane with the TUG and required minimal assistance of 1 person on the sit-to-stand activity. She was able to complete the TUG with a 4WW and the sit-to-stand activity with supervision on her final assessment. Scores less than 20 seconds indicate a 64% chance of ruling out a fall, compared to her first score, which was not accounted for due to being so high.¹³ The mean score for participants in the TUG is 25.5 seconds and the modified TUG had a mean score of 3, indicating some fall risk.¹³ The 30-second sit-to-stand was shown to be reliable and valid on initial and discharge scores compared to the Berg Balance Scale.²⁰ Improved results are due to the interventions completed in therapy sessions.

Table 6. Outcome Measures - Final

Timed Up and Go (TUG)	22 seconds
30 second sit to stand	4 sit to stands

The patient responded well to interventions completed during rehabilitation sessions. She enjoyed completing supine strengthening exercises and indicated she could feel them make her stronger. As shown in the concluding section GG, the patient improved in functional strength to a point where safe discharge would be acceptable if there were no complications with her upper extremities. Due to the patient having support at home from her family, safety precautions and discussions were communicated with the patient and the family during the care conference on how to prevent another fall and make the transition home safe. Falling hazards were to be removed like rugs and stray

cords. Grab bars were placed in the bathroom for the patient's safety on toilet and tub transfers. Medication management and meal deliveries were set up to ensure the patient was maintaining good health after discharge.

A clinometric tool was not used with the patient during her stay at the SNF for PT. She was being assessed by all members of the SNF for underlying or new conditions or functional deficits. With future patients who present similarly to this patient, administration of the WHO-5 Well-Being Index could be beneficial. Often staying in a rehabilitation center can feel monotonous. The WHO-5 asks 5 subjective questions relating to the patient's well-being and follows the layout of the Major Depression Inventory.²¹ It is a sensitive and specific screening tool for depression and is applicable to all ages and all fields of medicine.²¹ See Appendix A for a copy of the WHO-5. It is valuable to determine how the patient is feeling during treatment as well as during their stay in a SNF to ensure recovery and good mental health. The WHO-5 may have been beneficial due to the patient's underlying psychiatric problems.

In the beginning of the episode of care for this patient, compliance was an issue. The patient's behavior and underlying psychosomatic and psychiatric problems were unclear and the staff was unaware on evaluation. The patient was passive and did not take responsibility for her rehabilitation and relied heavily on one physical therapist for rehabilitation and on nursing staff to complete her ADLs for her. The patient was aggressive towards staff during her first week, lacked trust and was demanding of time and resources. To cross this barrier, communication and behavior modification were two strategies used by staff to reverse this negative thinking and increase compliance.¹⁶ In depth explanations on what, how, why interventions were being completed, how this

would result in her returning home, and who was being billed for her stay were completed multiple times a day, every day.¹⁶ The staff members were encouraged to be open and honest, demonstrate active listening, and adjust their approach to gain rapport, build patient confidence, and meet the needs of the patient.¹⁶ Daily goals set with the patient, signs were used in the patient's room, positive reinforcements, and encouraging the patient to become a more active advocate for her role in PT were behavior modifications utilized, leading to a satisfied patient.¹⁶

Once the patient was comfortable being in the new environment and the new staff members, the patient was satisfied with her care. She expressed to therapy and nursing staff her admiration and appreciation for what we were doing for her. After seeing the patient for six weeks, five days a week, the patient built great rapport and developed a great connection with staff.

Due to unforeseen circumstances, the patient's full discharge information was not received by the author. The patient was not discharged on time and the lead physical therapist does not work in the facility anymore. Due to these reasons, information was based on the six weeks that the patient was seen, with assumption the plan of care was followed, and the patient was discharged shortly after the final discharge information was collected by staff members.

CHAPTER V

DISCUSSION

The purpose of this case study was to describe the PT management of a patient with a proximal humeral fracture, following a prolonged hospital stay resulting in deconditioning. There were a few differences between a patient with a proximal humeral fracture, and one with deconditioning and difficult tendencies. The differences were highlighted throughout the case study, emphasizing the importance of prescribing PT intensity appropriately, the effects of HAD, and patient education.

Initially, the patient's prognosis was poor due to her behaviors but was changed to good once the patient started participating in PT, showing improvements in function and adherence rehabilitation. Patient education and PT practice were based on making adaptations for noncompliant patients. Strategies used to build patient trust and adherence involved explanations, active listening, honesty, counseling, and active participation.¹⁶ The patient responded well to these strategies and became very willing and involved in her rehabilitation. Physical therapy intensity was based on specificity training on moderate to high intensity exercises, avoiding low intensity, general conditioning activities. A high intensity rating of a 70-80% 1RM is similar to a rating of 15-17 on the Borg Rating scale for perceived exertion as a method to assess how hard the patient feels she was exercising during PT.¹ Staying within this intensity, targeting lower extremity extensor muscles, hip abductors, and core musculature, and emphasizing functional

movements through bed mobility, transfers, and ambulation, the differences in the patient's progression can be seen by comparing Table 1 to Table 5.^{6,10}

The patient's strength and level of function were the main impairments that were addressed by PT staff. The patient returned to her prior level of function in order to return home. Her pain levels went from 4-5/10 to minimal to no pain. She did not have any pressure sores form during her time in the SNF. Her ability to lift her head to check her surroundings with ambulation increased from not being able to look past her feet, to being able to look up and anticipate turns and obstacles. She was able to return to the assistive device she was using prior to her hospital stay. A final method of assessment used was outcome measures TUG and 30 second sit-to-stand. She was able to improve both substantially, as seen in Table 2, compared to Table 6. Using the section GG, TUG, and 30 second sit to stand results, the patient's interventions were able to be addressed based on areas that needed improvement. Bed mobility, transfers, turning, and ambulation, all pieces to each of these three measuring tools, were combined with strengthening exercises and formulated into the plan of care and interventions. This was done for function, to track progress, and to refamiliarize the patient with what she was able to complete prior to the fall and give her the tools to maintain her function.

Therefore, this case study found success in using specific exercises given at moderate to high intensities beneficial to combat HAD and other general weaknesses that may occur from being bedridden. Using function can help translate to the patient's daily life and encourage patient buy-in. Modifying rehabilitation approach based on the patient's behavior, emphasizing patient education, building rapport, and encouraging

active participation in the patient's own care, were beneficial for difficult patient behaviors and underlying psychosomatic and psychosocial aspects.

There are no published case studies that describe an admitted SNF patient, following a proximal humeral fracture, with signs of HAD and lack of compliance. Due to the specificity of this patient, it is difficult to compare this patient's results with patient's with parts of this diagnosis. There is research on HAD available, however with an unclear diagnosis, variable terminology, and no formal practice guidelines to follow, it is not applicable to this case.

Recommendations for future case studies involving patient's with HAD include knowing all possible terms that could be used to classify HAD, as well as comparing the differences between those terms. This is important because a single term used for diagnosis can lead to uniformity in examination, evaluation, and treatment. A more uniform term can lead to better treatment during the hospital stay that can dramatically decrease the number of patients suffering from HAD or ICU acquired weakness.

A limitation of this case report was the unplanned discharge date delay. Because of this, a full discharge was documented in this study. Another limitation to this case was in inability to attain further information on this patient due to the lead physical therapist no longer working at the facility. This prevented discharge information, medication information, and any other pertinent information from being received by the author. A final limitation was the lack of knowledge to the full extent of the different terms used for HAD. This could have limited search criteria for articles and case studies for further information that could have been included in this case study.

Reflective Practice

During the initial evaluation, the patient was argumentative, agitated, and unwilling to work with staff members. This made it difficult to ask the patient questions. Most of the information about her prior level of function and current level of function was taken from the hospital notes that were provided to us on admission and from family information. Any information would have been helpful if provided by the patient to get her point of view to make her feel more included in the evaluation. Due to her difficult behaviors, in the future, I would have spent more time at the beginning trying to learn more about her passions to build rapport sooner. Formal examination procedures were also hard to complete due to her lack of compliance. In the future, I would have also completed a more formal strength screen using manual muscle testing, even if in a seated position, of her lower extremity for more detailed information. The section GG was a valuable tool to assess function and was important for reimbursement so that measure took priority. For the plan of care, I would have added more balance exercises towards the end of therapy when she was the most compliant, even though she did not prefer them. Part of intervention for falls is balance training so this was important. The patient fit into physical therapy's scope of practice, came from a hospital, and was constantly monitored by nursing staff. For these reasons, I would not refer this patient out. For this case study, areas that may benefit from additional research would be the prognosis of diagnosis and prognosis of HAD. Due to the lack of uniformity on terminology, a limited amount of research was found in databases.

A formal cost benefit analysis for this patient was difficult, because the patient was not paying for therapy out of pocket and was covered by insurance. Therefore, a cost

benefit analysis was completed using a 2019 Medicare fee calculator found on American Physical Therapy Association.²² The patient's episode of care contained 27 visits, equaling a total cost of \$1,365.38. The patient's total cost is 25% of the total episode of care, equaling \$341.35 total and \$12.64 per visit. The patient received 23 units of therapeutic exercise and therapeutic, activity, 3 units of gait training, 1 unit of neuromuscular re-education, and a moderate complexity evaluation. The patient was retired and had reduction in salary from being in PT and lived at the SNF and required no added cost for transportation. Based on the satisfaction of the patient at the end of the episode of care and the increase in function, the benefit outweighed the cost of PT. Due to the required therapy frequency for skilled patients at the SNF, therapy could not be completed less frequently, and decreasing costs would have been difficult for this patient.

This patient taught me a lot about the geriatric population. This patient inspired me to complete an in-service on geriatric exercise prescription and, avoiding underdosing exercise prescriptions, which is a huge problem in the geriatric community. She taught me how important it is to see the patient and not just see their age and assume they can not handle a higher intensity. She also taught me a lot about patience and gratitude. Seeing her during the first week and how much she blossomed over the six weeks we were together was a rewarding experience. Understanding how a patient learns and responds to others is important on how they will participate and be compliant. The rapport we built with each other helped me be able to feed off her to understand what kind of motivation she needed for the day to complete her therapy. Having a patient refused all things rehabilitation, to having PT be her favorite part of the day is something I hope to inspire in all patients. Being able to learn from patients on how to better interact with all learning

styles is something I will be able to use in all age groups, in all settings, in different areas of life and in PT.

APPENDIX

The WHO-5 questionnaire

Instructions:

Please indicate for each of the 5 statements which is closest to how you have been feeling over the past 2 weeks.

Over the past 2 weeks...	All of the time	Most of the time	More than half the time	Less than half the time	Some of the time	At no time
1 ... I have felt cheerful and in good spirits	5	4	3	2	1	0
2 ... I have felt calm and relaxed	5	4	3	2	1	0
3 ... I have felt active and vigorous	5	4	3	2	1	0
4 ... I woke up feeling fresh and rested	5	4	3	2	1	0
5 ... my daily life has been filled with things that interest me	5	4	3	2	1	0

Scoring principle: The raw score ranging from 0 to 25 is multiplied by 4 to give the final score from 0 representing the worst imaginable well-being to 100 representing the best imaginable well-being.

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