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Physical Therapy And Cognitive Behavioral Therapy In A Patient With Multiple Co-Morbidities – A Case Report

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Physical Therapy and Cognitive Behavioral Therapy in a Patient with Multiple Co-morbidities – A Case Report

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The patient signed an informed consent allowing the use of medical information for this report and received information on the institution's policies regarding the Health Insurance Portability and Accountability Act.

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ABSTRACT

Background and Purpose: Cognitive behavioral therapy (CBT) is grounded in the premise that by altering a patient's negative thought processes, one can improve functional and emotional health.[1] When multiple co-morbidities limit traditional physical therapy interventions, CBT may be a consideration. While CBT has shown benefits in patients with cancer and others, there is a lack of research investigating its effectiveness in conjunction with physical therapy (PT) in the medically complex patient. The purpose of this case report was to document the outcomes of CBT along with traditional PT for a medically complex patient diagnosed with end stage renal disease and multiple co-morbidities.

Case Description: The patient, a 51-year-old male, was admitted to a skilled nursing facility after a recent transmetatarsal amputation of the left foot. His medical history revealed multiple chronic diseases including bilateral (BL) foot ischemia, acute osteomyelitis of the L ankle and foot, morbid obesity, diabetes mellitus type 2, vasculitis, chronic dry gangrene on the R foot, peripheral vascular disease (PVD), methicillin-resistant staphylococcus aureus (MRSA), enterocolitis, congestive heart failure (CHF), hypertension (HTN), atherosclerosis, and a previous heart valve replacement surgery. At initial evaluation (IE), he demonstrated a significant decrease in activity tolerance, motivation, and did not report a strong social or family support system. A plan of care (POC) including traditional PT interventions and CBT were introduced. Interventions focused on activity tolerance, strength, balance and coordination training and outcomes measured with timed tolerance to sitting and standing.

Outcomes: The patient demonstrated improvements in activity tolerance, trunk control and confidence during sitting and standing activities. Sitting tolerance improved from 1 minute 3s at IE to 30 minutes at discharge. Standing tolerance improved from 28 seconds at IE to 5 minutes and 32 seconds at discharge. His POC was not completed and he was re-admitted to the hospital

due to an exacerbation in his medical condition requiring a below the knee (BTK) amputation on his left lower extremity.

Discussion: Although it is unclear whether the addition of CBT or traditional PT interventions were the primary factor in the gains made, the patient reported a higher level of confidence and found the inclusion of CBT helpful. Further research is encouraged to investigate the effects of CBT on complex patients and the optimal outcome measures to document its efficacy.

Word Count: 3,205

BACKGROUND and PURPOSE

Cognitive behavioral therapy (CBT) is one of the most utilized and researched branches of psychotherapy.[1,2] It is widely used in the field of psychology and has been found to demonstrate improvements in patients with various psychological disorders including depression, bipolar disorder, anxiety disorder, eating disorders, chronic pain, fatigue disorders and post-traumatic stress disorder (PTSD).[1,2,3] This technique focuses on an active collaboration between the patient and therapist; challenging the patient by critically investigating their negative thoughts, emotions and behaviors with an overall goal of improving their functional and emotional well-being.[4,5] The methods are based on various areas including personal thoughts, feelings, behaviors, physical symptoms, and the situation.[5] The theory further suggests that since all of these areas interact with one other, one would be able to modify an area and create a positive effect to the situation.[5] CBT has also demonstrated its effectiveness in various patient populations in physical therapy (PT).

CBT has been investigated in patients who have undergone various spinal surgeries due to low back pain. In a case series by Archer, et al, the use of CBT was shown to have a positive influence on the decrease in fear of movement, pain, disability and function during PT.[6] Their program focused on 4 aspects of CBT: self-management, problem solving, cognitive restructuring and relaxation training.[6] Based on a 6-month (post-intervention) and an 8-month follow-up assessment, 7 out of 8 patients demonstrated a clinically significant reduction in fear.[6] All 8 patients demonstrated decreased scores on the Tampa Scale for Kinesiophobia (TSK), Pain Catastrophizing Scale (PCS), and the Patient Health Questionnaire (PHQ-9).[6]

In a randomized controlled trial (RCT) by Goedendorp, et al, patient's who were found to have increased fatigability during physical activity, diagnosed with various malignancies and were undergoing cancer treatments found that utilizing CBT during cancer treatments were

effective. It contributed to reduced fatigue at least 2-months after cancer treatment as compared to a brief nursing intervention and usual care.[7] The 6-month span of treatment sessions included education on physical activity, fixed bedtimes, consequences of cancer and future planning such as returning to work.[7] CBT has also been effective in community-dwelling elderly adults with depression. A study conducted by Huang, et al, found that CBT, along with physical activity, decreased symptoms of depression and an increased 6-minute walk test score.

Patients classified as medically complex may pose a challenge to the PT rehabilitation team. Complex patients have been defined as patients with a co-occurrence of two or more medical conditions.[9] According to a recent cohort study, primary care physicians have now defined the complex patient based on various medical, social, and behavioral factors posing a strong influence on additional disabilities and further complications.[10] A patient who is medically complex and a patient with multiple co-morbidities will be used interchangeably in this case report.

While CBT has been demonstrated to be effective in a multitude of psychological disorders, various spinal surgeries, patients with cancer, and the elderly, there is a deficit in research on its effects on patients with multiple co-morbidities. Therefore, the purpose of this case report was to determine the effectiveness of a combined approach of traditional physical therapy and CBT for a patient with multiple co-morbidities.

CASE DESCRIPTION

Patient History and Systems Review

The patient a 51-year-old, a United States Post Office employee, had a succession of chronic and acute conditions exacerbated within a year. He was admitted to a skilled nursing facility (SNF) with a principal diagnosis of acute osteomyelitis of the right (R) ankle and foot resulting in a left (L) transmetatarsal amputation (Figure 1 & 2). His medical history included:

bilateral (BL) foot ischemia, acute osteomyelitis of the L ankle and foot, morbid obesity, diabetes mellitus type 2, vasculitis, chronic dry gangrene on the R foot, peripheral vascular disease (PVD), methicillin-resistant staphylococcus aureus (MRSA), enterocolitis, congestive heart failure (CHF), hypertension (HTN), atherosclerosis, and a previous heart valve replacement surgery. Due to acute osteomyelitis from an ulcer on the L dorsum of the foot, the patient had a negative pressure wound vacuum (NPWV) placed continuously (Figure 3 & 4). He received hemodialysis 3 times a week, along with PT and occupational therapy (OT). His medical team also included medical doctors, wound specialists and nursing. The patient's chief complaints included impaired sitting and standing balance, decreased activity tolerance, nausea and pain. He also demonstrated substantial fear of falling and signs of pain exacerbation by fear/anxiety, limiting his amount of participation. The patient's goals included improving his independence in activities of daily living (ADL), instrumental ADL's (IADL) and returning home pain-free with an assistive device. Informed consent was received from the patient to document images and data for this case report. (Table 1)

Clinical Impression 1

The patient demonstrated a significant decrease in independence and was unable to participate in most ADL's and IADL's including bed mobility, transferring, walking, toileting, dressing and grooming due to primary and secondary impairments related to the patient's medical diagnosis and multiple comorbidities. These resulted in decreased activity tolerance, decreased gross BL lower extremity (LE) strength, pain, impairments in sitting and standing balance and impairments in sensation of bilateral LE (BLE). Further examination was required and tests and measures were incorporated including range of motion (ROM), manual muscle testing (MMT), sensation testing, numeric pain rating scale (NPRS), posture observation and a timed sitting and standing balance/tolerance assessment. A differential diagnosis was not

hypothesized due to his multiple comorbidities. The patient was deemed an excellent candidate for this case report based on the complexity of his condition, the unique approach to his plan of care (POC).

EXAMINATION

Tests and Measures

Tests and measures utilized during the IE and discharge were based on the Tests and Measures categorized in the Guide to Physical Therapist Practice.[11] Based on the patient's diagnosis and multiple co-morbidities tests and measures included were: heart rate (HR), respiration rate (RR), blood pressure (BP), blood oxygen level (spO2), range of motion (ROM), manual muscle testing (MMT), sensation, numeric pain rating scale (NPRS), posture observation, skin observation, sitting tolerance (timed observation) and standing tolerance (timed observation) (Table 2).

Manual muscle testing is a popular method used to evaluate a patient's strength. According to Cuthbert, et al, based on various studies on MMT, they have determined a range from 82% to 97% agreement for inter-rater reliability and from 96% to 98% for test-retest reliability.[12] They conclude that this means an indication that a clinically significant change in strength is when a MMT score changes more than one full grade.[12]

Clinical Impression 2

Based on previous hypotheses, the previous clinical impression of increased dependence with ADL's and IADL's was confirmed. The patient's primary medical diagnosis was S98.912D indicating a complete traumatic amputation of L foot, level unspecified. His physical therapy treatment diagnosis includes M62.81 muscle weakness (generalized), R26.2 difficulty in walking, not elsewhere classified, R27.9 unspecified lack of coordination, and R29.3 abnormal posture.

The patient was expected to benefit from the POC due to his prior functional independence, ability to follow multi-step commands and motivation for recovery. Inhibiting factors included chronic pain secondary to a progressive disease pathology, poor family and social support, presentation of a complicated medical condition, active hemodialysis treatment, and a fear of falling. A study done by Mandolfino, et al, found that patients with diabetes who had undergone a transmetatarsal amputation to treat forefoot infection and gangrene presented with a 34% re-amputation rate and 12.6% re-amputation based on 218 patients[13]. This may indicate another possible hindrance to the patient's progress in PT.

Short-term goals (STG) primarily focused on improvements in functional mobility tasks. These included bed mobility, sit to stand, stand to sit, sitting tolerance and standing tolerance. These were deemed important in order to increase gross trunk, LE and upper extremity (UE) strength, improve his interaction with environment and facilitate a return to prior level of function. Overall, the patient's long-term goals (LTG) included the ability to perform bed mobility, functional transfers and to ambulate with a rolling walker to the toilet (Table 3).

Intervention

The patient received PT 5-7 days per week for 6 weeks with varying session durations ranging from 45 minutes to 90 minutes. The primary interprofessional team consisted of physical therapy (PT), occupational therapy (OT), nursing and social work. Each PT treatment session was documented using an electronic medical record system (EMR). Effective coordination between each profession was based on verbal and written communication. Patient/client related instructions were provided via verbal instructions and demonstrations and a visual handout for a home exercise program (HEP).

Due to the scheduling approach by the facility, the patient was seen by various physical therapists each week. This created challenges with proper coordination of care and required

consistent communication with each physical therapist involved in his POC through EMR. The patient's compliance varied from therapist to therapist and was often fearful when performing new interventions. There were 2 known refusals of therapy throughout the 6 week POC.

After a plateau in progress and low motivation to fully participate in each therapy session, the focus of the patient's therapy was changed from an emphasis on rehabilitation of functional mobility to a progressive CBT program. The new CBT program included graded exposure, activity pacing, goal setting, problem solving, cognitive restructuring, attention diversion, and maintenance strategies, along with therapeutic exercise, bed mobility training, transfer training, balance training and brief gait training based on both activity limitations and participation restrictions. Due to the level of deconditioning the patient presented with at the onset of therapy, safety precautions were utilized including consistent use of a gait belt and 2-person minimum assist (min A x 2) during transfers.

Bed mobility training was performed 3 to 4 times a week for 6 weeks. Fifteen to 25 minutes of the total treatment time were utilized and focused on rolling from side to side, lateral scooting, and supine to and from sitting at the edge of the bed. Initially, all bed mobility tasks required maximum assistance (max A) of 2 people due to the patient's decreased activity tolerance, pain, and overall general weakness. With an increase in functional mobility, at week 3, the patient progressed to moderate assistance (mod A) of 2 people and minimum assistance (min A) of 2 people at week 6. Various verbal, tactile, and visual cues were utilized to improve key muscle activation and initiation of rolling and supine to and from sitting. Education was provided on efficiently utilizing UE musculature for various segments of bed mobility such as pushing up from the bed during a supine to sit transfer. Lateral scooting was addressed with proper positioning of BLE in knee flexion (Table 2).

Balance training was performed 3 to 4 times a week for 6 weeks. Thirty minutes of the

total treatment time were utilized for static sitting balance (SSB), dynamic sitting balance (DSB) and static standing balance (SStB) training. According to a study by Haruyama, et al, core stability training has beneficial effects on trunk function, standing balance, and mobility.[16] SSB, DSB and SStB training were supplemented with core stability/strength training. These were further addressed through functional interventions that incorporated dynamic weight shifting in lateral and anterior/posterior planes, static sitting balance with and without UE support, dynamic sitting reaching activities with and without UE support and static standing balance with UE support. Verbal, tactile, and visual cues were provided to improve key muscle activation, proper sitting and standing posture, and proper foot placement. The purposes of these cues were to improve base of support, to improve stability, and facilitate safety awareness during sitting and standing activities. At week 5, SSB training was discharged due to improvements in sitting posture, activity tolerance and functional independence with and without UE when eating. Initial SSB was recorded at 1 minute and 32 seconds and was re-assessed at every PT session. Initial SStB was first reported at week 4 at 28 seconds and was re-assessed at every following PT session (Table 2).

For 4 weeks, transfer training was performed 3 to 4 times a week for 30 minutes of the allotted treatment time. It was initiated at week 3, due the patient's decreased activity tolerance and significant reports of fear, pain, fatigue, and dizziness. For weeks 1 to 2, a Hoyer lift was the primary method done by nursing for transfers in and out of bed. This was only done when required to transfer from the bed to a stretcher for transportation to hemodialysis. Due to an increase in trunk control and based on the patient's improvements in dynamic sitting balance, sliding board transfer training from the bed to the wheelchair at week 3 was initiated. At week 4, sit to stand transfers with a rolling walker (RW) from bed to wheelchair were initiated (Table 2).

Cognitive-behavioral therapy (CBT) was initiated at the end of week 3. The patient was

not showing significant progress with traditional PT methods; therefore, we examined the use CBT and added this technique to his POC. CBT's main goal was to reshape the patient's negative thoughts, feelings, and behaviors to help improve functional independence and increased activity tolerance.

CBT strategies and interventions have been utilized for various issues including depression, anxiety, and PTSD and have shown improvements in patients' quality of life. According to Rundell, et al, "relationships characterized by problematic behaviors and emotions are modifiable by mitigating dysfunctional thought patterns through directed, systematic, and goal-oriented treatments."[7]

Various techniques were utilized throughout week 3 through 6 and included graded exposure, activity pacing, cognitive restructuring, attention diversion strategies, goal setting, problem solving strategies and maintenance strategies. Graded exposure is defined as a gradual and systematic progression of therapeutic exercise from the onset of therapy. Activity pacing was used to determine optimal scheduling of therapy each day and in accordance to his hemodialysis appointments. It also included a focus on reduced speeds of activities and enforcement of consistent rest breaks during activities by consulting with the patient for optimal times. These were revised based on patient success throughout each therapy session. Cognitive restructuring was used to identify negative thoughts and aspects that prevented the patient from fully participating in therapy including pathology and physiology of pain, reshaping of the idea that pain will continue regardless activity level, and addressed the causes and results of fear. Attention diversion strategies, which distracted the patient from pain and encouraged the patient to increase participation in therapy with conversations on fishing, hiking and other interests during each session. Goal setting was created with the patient by developing specific, reasonable, objective, and patient centered goals and activity pacing to maintain a consistent and tolerable

pace for the patient to manage. The patient wrote down these goals during the session in a personal notebook. Problem solving strategies were created with the patient identifying potential barriers to progress, re-addressing personal short-term and long-term goals, and creating alternative activities by documenting these in a personal notebook. This strategy was used to help the patient determine a solution in continuing adherence to therapy program. Maintenance strategies for continued participation throughout the patient's plan of care included education on pain management with AROM, medication, and continued progression of current exercise program. See Table 4 for detailed information on interventions.

Gait training with a rolling walker (RW) was only performed once during the patient's rehabilitation program and was initiated during week 6 for 30 minutes. The patient demonstrated increased trunk control during static and dynamic balance and also showed an increase in confidence and motivation. During CBT training, the patient revealed their desire to utilize a toilet versus a bedpan. With a max A x 2, the patient was able to take 7 steps with a RW towards the bathroom with a wheelchair follow. Significant verbal, tactile, and visual cues were provided to improve key muscle activation, proper standing posture, proper gait mechanics, proper step pattern, and proper foot placement during gait (Table 2).

OUTCOMES

Outcome measurements were initiated at IE, prior to the implementation of the CBT program. After 6 weeks of physical therapy, the patient demonstrated an overall improvement in sitting and standing activity tolerance and an increased motivation to participate in therapy. Qualitative changes were verbally acknowledged by the patient and were reported as noticeable improvements in their ability to participate in therapy and the effectiveness incorporating CBT. Quantifiable changes were measured from IE to discharge and showed improvements. Sitting tolerance improved from 1 minute 32 seconds at IE to 30 minutes at discharge. Standing

tolerance improved from 28 seconds at IE to 5 minutes and 32 seconds at discharge. The patient's POC was not completed and he was re-admitted to the hospital due to an exacerbation in his medical condition requiring a further transtibial amputation (TTA) on his left lower extremity.

DISCUSSION

This case report demonstrated an implementation of the POC that included CBT along with traditional PT for a medically complex patient diagnosed with end stage renal disease and multiple co-morbidities. There is an abundance of research regarding CBT and its efficacy in patients with various psychological disorders. Through our literature review, comparatively, each article was able to demonstrate CBT's effectiveness in various patient populations. It's been shown to decrease anxiety and fatigue in patients with cancer, and increase 6MWT scores of elderly patient's with depression.[2,3,4]

With the added utilization of CBT, and as compared with other research, this patient's POC helped demonstrate quantitative and qualitative improvements. Although there is no definitive correlation between the use of CBT and an improvement in outcomes, the patient demonstrated progression in activity tolerance in minutes in sitting and standing balance from IE to discharge.

Throughout the rehabilitation process, various inhibiting factors were present and may have contributed to a decrease in the patient's quality of care and motivation to participate during therapy. The patient verbalized his unhappiness several times, often referring to his limited family involvement during his care at the SNF. This included the very few visits he had and decreased personal interactions with friends and family. Another inhibiting factor may have been the various physical therapists present in his POC.

Due to the structure of the facility, we were unable to coordinate and communicate a

succinct POC. Therapy scheduling may have contributed to an increase in complication of care for the patient. Schedules were determined the weekend prior to the workweek and physical therapists were placed at various facilities in the area based on the need of each facility. Additionally, no standardized outcome measures, such as the Acute Care Index of Function (ACIF), were utilized. This was in part due to decreased familiarity of the outcome measure tool by all physical therapists, the gap in communication of its utilization, and the varying physical therapist schedules.

Despite the patient making significant gains in overall functional mobility and improved activity tolerance in bed mobility and transfers, he was discharged to the hospital. Due to the progression of osteomyelitis in his L LE, he was awaiting a L LE TTA and did not complete the initial plan of care.

Although it is unclear whether the additions of CBT or traditional PT interventions were the primary factor in the gains made, the patient reported a higher level of confidence and found the inclusion of CBT helpful. Further research is encouraged to investigate the effects of CBT on complex patients and the optimal outcome measures to document its efficacy.

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TABLES and FIGURES

Table 1. Systems Review

Systems Review		
Cardiovascular/Pulmonary	Impaired	History of vasculitis, PVD, CHF, HTN, atherosclerosis, heart valve replacement surgery
Musculoskeletal	Impaired	Decreased ROM and strength
Neuromuscular	Impaired	Decreased sensation in BLE
Integumentary	Impaired	L transmetatarsal amputation; Multiple wounds/ulcers on BLE
Communication	Unimpaired	None.
Affect, Cognition, Language, Learning Style	Unimpaired	None.

Table 2. Tests and measures at initial evaluation and discharge

Tests & Measures	Initial Evaluation	Discharge
1. Heart rate (HR)	1. 64 beats per minute (pulse oximeter)	1. Not tested due to early discharge
2. Respiration rate (RR)	2. 19 breaths per minute (observation)	2. Not tested due to early discharge
3. Blood pressure (BP)	3. 136/81 (automatic blood pressure monitor)	3. Not tested due to early discharge
4. Blood oxygen level (SpO2)	4. 95% (pulse oximeter)	4. Unchanged
5. Range of Motion (ROM)	5. 30% decreased L and R hip extension	5. Not tested due to early discharge
6. MMT of BLE musculature	6. Gross MMT = 3-/5 R LE and 3/5 L LE	6. Gross MMT = 3/5 R LE and 3+/5 L LE
a. BL Ankle	a. Limited by pain BL	a. Limited by pain BL
b. BL Knee	b. Limited by pain BL	b. Limited by pain BL
c. BL Hip	c. Limited by pain BL	c. Limited by pain BL
7. Sensation	7. Decreased sensation on BLE with crude touch	7. Unchanged
8. Numeric Pain Rating Scale (NPRS)	8. 7/10 on distal BLE on NPRS	8. 7/10 on distal BLE on NPRS
9. Posture observation	9. Sitting posture: kyphotic Standing posture: not assessed at this time	9. Sitting posture: unchanged Standing posture: Swayback posture with AD
10. Skin observation	10. R dorsal foot ulcer; 2 L distal lateral leg wounds, 100% necrotic, inflamed erythema in the periwound	10. Unchanged
11. Sitting tolerance (timed observation)	11. 1 minute 32 seconds	11. 30 minutes
12. Standing tolerance (timed observation)	12. Unable to safely attempt	12. 5 minutes and 32 seconds

412 **Table 3**. Short-term goals and Long-term goals

STG (2 weeks)	**Goals Met?**
Tolerate upright sitting in wheelchair for 5 minutes	Yes
Transition from supine to sitting position with maximum assistance x 2	No
Improve sitting dynamic balance with minimum assistance	No
Moderate assistance to reach ipsilateral (IL) side indicating a rating of poor plus (P+)	No
Improve gross BLE muscle strength to a grade of 3+/5	No
Perform bed to wheelchair transfers with maximum assistance	Yes
LTG (4 weeks)	
Complete bed mobility safely with minimal assistance	No
Complete functional transfers safely with minimal assistance	No
Ambulate 10 feet safely with a rolling walker from the bed to the toilet	No

413

414 **Table 4.** Description, purpose and progression of interventions performed on a weekly basis with the use of supplemental oxygen.

	Week 1	**Week 2**	**Week 3**	**Week 4**	**Week 5**	**Week 6**
Therapeutic Exercise	Supine BLE AROM - 5 reps x 4 sets Supine isometric BLE for hip and knee extensors – 5 reps x 2 sets x 5 sec holds Seated trunk AROM 10 reps x 2 sets - 25 mins	Supine BLE AROM - 10 reps x 3 sets Supine isometric BLE for hip and knee extensors – 5 reps x 2 sets x 8 sec holds Seated trunk AROM with therapy ball - 10 reps x 2 sets - 25 mins	Supine BLE with 1# ankle weights - 10 reps x 3 sets Supine isometric BLE for hip and knee extensors - 10 reps x 2 sets x 8 sec holds Seated trunk and LE 10 reps x 3 sets - 20 mins	Supine BLE AROM with 2# ankle weights and 10 reps x 3 sets Seated trunk and LE 10 reps x 3 sets - 15 mins	Supine BLE AROM with 2# ankle weights 10 reps x 3 sets Seated trunk and LE 10 reps x 3 sets - 15 mins	Supine BLE AROM with 2.5# ankle weights 10 reps x 3 sets Seated trunk and LE 10 reps x 3 sets - 15 mins
Bed Mobility Training	Rolling side to side Lateral scooting Supine <> sit - 30 mins Max A x 2	Rolling side to side Lateral scooting Supine <> sit - 30 mins Max A x 2	Rolling side to side Lateral scooting Supine <> sit - 25 mins Mod A x 2	Rolling side to side Lateral scooting Supine <> sit - 20 mins Mod A	Rolling side to side Lateral scooting Supine <> sit - 15 mins Mod A	Rolling side to side Lateral scooting Supine <> sit - 10 mins Min A
Balance Training	SSB DSB - 30 mins	SSB DSB - 30 mins	SSB DSB - 30 mins	SSB DSB SStB - 30 mins	DSB SStB - 30 mins	DSB SStB – 30 mins
Transfer Training	Hoyer lift primary method of transfers	Hoyer lift primary method of transfers	Sliding board – 30 mins Max A x 2	Sliding board Sit to stand (RW) – 30 mins Mod A x 2	Sit to stand (RW) – 30 mins Mod A x 2	Sit to stand (RW) – 30 mins Min A x 2
Gait Training	Not initiated at this time due to decreased trunk stability	Not initiated at this time due to decreased trunk stability	Not initiated at this time due to decreased trunk stability	Not initiated at this time due to decreased trunk stability	Not initiated at this time due to decreased trunk stability	Gait training with rolling walker – 30 mins Max A x 2
Cognitive Behavioral Therapy (CBT)	Not initiated at this time	Not initiated at this time	Initiated CBT techniques: -Graded exposure. -Cognitive restructuring. -Attention Diversion. -Activity pacing. -Goal setting -Problem solving strategies -Maintenance strategies - 30 mins	-Graded exposure. -Cognitive restructuring. -Attention Diversion. -Activity pacing. -Goal setting -Problem solving strategies -Maintenance strategies - 20 mins	-Graded exposure. -Cognitive restructuring. -Attention Diversion. -Activity pacing. -Goal setting -Problem solving strategies -Maintenance strategies - 20 mins	-Graded exposure. -Cognitive restructuring. -Attention Diversion. -Activity pacing. -Goal setting -Problem solving strategies -Maintenance strategies - 20 mins

415 [+]Significant rest breaks were required throughout every PT session due to decreased activity tolerance during activities as well as verbalized reports of pain and nausea associated with multiple comorbidities; pursed lip breathing exercises
416 were performed during each rest period and vital signs were monitored during each session.
417 <>: to and from
418 Max A: maximum assistance
419 Mod A: moderate assistance
420 Min A: minimum assistance
421 CGA: contact guard assistance
422 SBA: stand by assistance

Figure 1.

L transmetatarsal amputation with dressing (medial view)

Figure 2.

L transmetatarsal amputation with dressing (anterior view)

Figure 3.

R plantar aspect of foot; Gangrene visible on 2nd and 4th digits

Figure 4.

R dorsal aspect of foot with negative pressure wound vacuum