Treatment of a 65 Year Old Deconditioned Female Admitted with Complications Resulting from Morbid Obesity: A Case Report

David Sarvin
Governors State University

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Treatment of a 65 year old Deconditioned Female admitted with complications resulting from morbid obesity: A case report

David Sarvin
BS, University of Illinois at Urbana-Champaign, 2009

CAPSTONE PROJECT

Submitted in partial fulfillment of the requirements

For the degree of Doctor of Physical Therapy

Governors State University
University Park, IL 604842015

2015
Abstract/Case Description

Background and Purpose:

Obesity is a medical diagnoses in which excess body fat has accumulated to the extent where it may have an adverse effect on health. Obesity is a growing concern among the population of adults and children living in the United States. It costs the medical industry a great deal of money each year treating these patients, especially in those individuals classified as morbidly obese. With unhealthy lifestyle choices more accessible than ever, it is important to understand the risk factors involved.

In many cases, obesity poses serious threats to the cardiovascular system, such as hyperlipidemia, hypertension, and congestive heart failure. If untreated, these risk factors can result in stroke, heart attack, or possibly death. In severe cases, the obesity is considerable enough to be considered morbid, and may require hospitalization. In this setting, the patient can be monitored, diet can be controlled, and physical therapy can try and decrease body fat and improve level of conditioning.

The most widely used instrument to measure obesity is the Body Mass Index, or BMI. The BMI is an evidence based classification system used to categorize level of obesity. The BMI classifications are divided as follows: greater or equal to 35 indicates severe obesity, greater or equal to 40 indicates morbid obesity, and greater or equal to 50 indicates super obesity. In this patient example, BMI was at a level of 48, which would
certainly fall under the classification of morbidly obese. The purpose of this study is to assess effectiveness of a cardiovascular based treatment plan on a deconditioned subject who suffers from complications resulting from morbid obesity.

**History:**

The patient described in this case study is a 65 year old Caucasian female admitted to the skilled nursing facility with complications resulting from morbid obesity, among other co-morbidities. These co-morbidities included hypertension, congestive heart failure, type II diabetes mellitus, hyperlipidemia, osteoarthritis, and unspecified gout. The patient was seeking physical therapy care to reduce risks, as well as improve exercise tolerance in order to facilitate improved activities of daily living participation in both the household and the community. Her primary functional limitations were bed transfers, toilet and shower transfers, and ambulation. She began having problems in May 2014, where her weight and decreased level of conditioning began limiting her functional abilities enough to miss important family and social events. A few weeks later her condition had gotten worse to the point where she felt a change needed to happen for her overall health, as well as her ability to tolerate functional activity. She was highly self-aware of her condition, and extremely motivated to improve her condition. Her goals were to return home to see her children and grandchildren, as well
as be more independent with ADLs. The patient is currently retired, and spends her free time at home. The patient is currently living at home with her husband, who also acts as a caregiver to assist with activities of daily living and other functional activities. The patient has 2 children, one living in the immediate area who also acts as a secondary caregiver if her husband is unavailable. She lives in a one-story home with wheelchair ramp access via the front door. Her prior level of function included ambulating short distances with axillary crutches in her household, and using a wheelchair (with assistance from her caregiver) for community ambulation. Medications included Norco for knee and overall musculoskeletal pain, Metoprolol to regulate cardiac function/ blood pressure\textsuperscript{3}, and Niaspan to assist with complications from hyperlipidemia.

**Systems Review:**

Upon examination, the main complaints of the patient were bilateral knee pain, as well as the inability to tolerate ambulation and performing functional activities without becoming fatigued. Her cardiopulmonary, integumentary, and musculoskeletal systems were impaired during examination. Her neuromuscular system presented as unaffected. These findings influenced the decision to perform a full upper and lower body examination, as well as assessing gait, transfers, bed mobility, and wheelchair mobility. This methods were chosen because they were the most
A comprehensive way to evaluate this patient assessing both upper and lower extremities. Data from initial examination was recorded as follows:

**Table 1.1: ROM results from Initial Examination**

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Flexion</th>
<th>Extension</th>
<th>Lateral Flexion</th>
<th>Rotation/Dev</th>
<th>IR/ER</th>
<th>Abd/Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical</td>
<td>AROM: WNL</td>
<td>AROM: WNL</td>
<td>AROM: WNL</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Shoulder</td>
<td>AROM: WNL B/L</td>
<td>AROM: WNL B/L</td>
<td>N/A</td>
<td>N/A</td>
<td>AROM: WNL B/L</td>
<td>AROM: WNL B/L</td>
</tr>
<tr>
<td>Elbow</td>
<td>AROM: WNL B/L</td>
<td>AROM: WNL B/L</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Wrist/Hand</td>
<td>AROM: WNL B/L</td>
<td>AROM: WNL B/L</td>
<td>N/A</td>
<td>AROM: WNL B/L</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Hip</td>
<td>AROM: 40 deg R, 45 deg L (limited by soft tissue/weakness)</td>
<td>N/A</td>
<td>N/A</td>
<td>AROM: 20 deg B/L (limited by soft tissue/weakness)</td>
<td>PROM: WNL B/L</td>
<td>AROM: WNL B/L</td>
</tr>
<tr>
<td>Knee</td>
<td>AROM: 72 deg R, 78 deg L (limited by soft tissue)</td>
<td>PROM: 84 deg R, 86 deg L</td>
<td>AROM: 4 deg ext B/L</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ankle/Foot</td>
<td>(Dorsiflexion)</td>
<td>AROM: WNL B/L</td>
<td>N/A</td>
<td>N/A</td>
<td>Inversion/Eversion: WNL B/L</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>(Plantarflexion):</td>
<td>AROM : WNL B/L</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1.2: Dermatomes, Myotomes and Reflexes from Initial Examination

<table>
<thead>
<tr>
<th>Myotome</th>
<th>C1-3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>T1</th>
<th>L1-2, L5</th>
<th>L3</th>
<th>L4</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>NT</td>
<td>4-/5</td>
<td>4/5</td>
<td>4/5</td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4+/5</td>
<td>4-/5</td>
<td>4/5</td>
<td>4/5</td>
<td></td>
</tr>
</tbody>
</table>

Reflexes: UE bilateral (C5-7) reflexes were 2+ (normal) and symmetrical. LE bilateral reflexes (L3 and S1) were 2+ and symmetrical.

Dermatomes: All bilateral UE and LE dermatomes were intact to light touch.

Table 1.3: Cardiopulmonary Data from Initial Examination

<table>
<thead>
<tr>
<th>BP: 132/86 (controlled by medication)</th>
<th>Pulse Rate: 82 bpm</th>
<th>Respiratory Rate: 18</th>
<th>O2 sat: 95%</th>
</tr>
</thead>
</table>

Table 1.4: Description of functional activity tolerance at initial examination

<table>
<thead>
<tr>
<th>Functional Activity/Test</th>
<th>Gait (distance)</th>
<th>Transfer</th>
<th>Bed Mobility</th>
<th>Wheelchair Mobility</th>
<th>TUG Score</th>
<th>Pain Level (NPRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance/Level of Assist</td>
<td>10 ft c axillary crutches</td>
<td>Max assist x2</td>
<td>Max assist x2</td>
<td>Max assist</td>
<td>19.84</td>
<td>9/10</td>
</tr>
</tbody>
</table>
Active Range of Motion for this patient was WNL for all motions in the UE. In the lower extremity, the patient was limited in bilateral hip flexion, hip internal and external rotation, knee flexion, knee extension by excess adipose tissue and pain. Values are listed above in table 1.1. All UE and LE Myotomes/manual muscle tests were 4+/5 except B/L hip flexion: 4-/5, B/L knee extension: 4-/5. B/L knee flexion 4/5. Mild swelling and tenderness to palpation were present diffusely around joint line/patella in B/L knees. All UE and LE dermatomes were intact to light touch. Reflexes were 2+ and symmetrical. Joint mobility and special tests were not performed due to tissue restrictions and pain. Pain level in B/L knees were at a 9/10 on the NPRS at the time of initial evaluation.

In terms of functional activities, the patient was at a level of Max assist x 2 for both transfers and bed mobility upon initial examination. Once upon axillary crutches, patient was able to ambulate 10 ft. with moderate assist. Wheelchair mobility was at a level of max assist. I performed the TUG test at initial examination to determine a baseline outcome measure that could be used to assess improvements, in which she scored an average of 19.84. Axillary crutches were also used during the TUG test due to balance and safety concerns.
**Clinical Impressions:** Based on the patients’ desire to participate, as well as the low level interventions prescribed at first, it was determined she was a good candidate to benefit from skilled physical therapy. Based on the tests and measures, patient history, and previous patient examples, she presented with a good prognosis for an improved PLOF upon discharge. Based on the data from the table, the patient is appropriate for the target interventions to improve bed mobility, gait training with assistive device, and improved cardiovascular exercise tolerance. The assessment of these 3 key areas will be crucial in determining the success of the current interventions, progressing toward goal achievement, and recommending the appropriate time for discharge. For the patient to be successful, research and subjective information suggest the ability to walk safely for at least 70-75 feet with axillary crutches to facilitate household and short distance community ambulation. Functional abilities would suggest the patient achieve the level of minimal or stand-by assistance in both bed mobility and transfers.

**Diagnosis, Prognosis and Goals:**

The patient has been diagnosed with morbid obesity. The patient presented with a good prognosis to return to her community and home environments with an improved level of cardiovascular function. The patient possesses a strong desire to return home and see her family, as well as
increasing her level of independence. Her work ethic during treatment indicated the desire to meet challenges and achieve goals set by therapists.

Short term goals would include an improvement in ambulation distance with axillary crutches from 10 feet to 30 feet with a level of contact guard. This would facilitate an improvement in functional abilities and the ability to safely maneuver in her home environment. Another goal established for the patient was achieving a level of min. assist with bed mobility. The method of intervention was specific to the patient (she has a pull bar attached to her bed), and focused on functional tasks. The final goal established prior to treatment was achieving minimal assistance level with transfers. Each one of these goals have a 2-3 week completion timeline.

Long term goals are goals that are to be achieved in approximately 4-6 weeks of care. They are not as time specific as short term goals, and can extend beyond the recommended timeline to achieve the goal (sometimes as long as 90 days). In this patient case, the long term goals were similar to the short term goals. The patient’s goal was to ambulate to 70 feet with a level of stand-by assist. This would encompass the longest the patient described she would have to travel to reach a different area of her property. Her bed mobility and transfer goals were at a level of stand-by assist prior to the completion of care. Both short term and long term goals were appropriate, functional, and with a plan to address the patient’s main limitations. It was important to remember the degree of morbid obesity and
the stress being put on the knees, and not make the goals unattainable\textsuperscript{4}. Table 2.1 illustrates goal progression and indicates all short and long term goals were met.

\textbf{Interventions:}

The interventions used have been deemed appropriate to the patient case by my initial examination as well as through research studies. Many factors were considered when deciding which specific interventions would be beneficial to the patient, including ability to perform and tolerate exercise, safety, and which activities were functional to her specific activities of daily living. This helped me formulate my desired plan of care, which was modified as treatment progressed. Treatment was focused on cardiovascular based interventions with an aim to decrease body fat, improve functional exercise tolerance, and facilitate an overall better quality of life. This gave the patient the best opportunity to make progression\textsuperscript{5,6}. Each intervention’s progression and eventual outcomes are included in Table 2.1. Examples of treatment interventions included:

\textbf{Bed Mobility and Transfers Training}

At initial examination, one of the first impressions of the patient were her difficulties with bed mobility and transfers. These are two of the most essential functional skills to address with a considerably deconditioned
patient. We started intervention immediately in order to try and prevent the formation of pressure ulcers, which are major concerns for obese patients confined to bed rest. Initially, the patient required maximal assist x 2 with each of these. Initially, 30 minutes was spent daily towards practicing each of these. By the fourth week of treatment only fifteen minutes of treatment were used in favor of progressing towards more functional activities. However, with patient education on proper mechanics, encouragement, and practice the patient was able to achieve a level of minimal assist in both bed mobility and transfers (supine-sit, sit-stand) by the end of the third week of treatment sessions. Based on these promising results and the positive relationship established with the patient, she was then further able to perform bed mobility and transfers at a level of stand by assist by the end of the seventh week.

**Endurance Training**

**Gait Training**

One of the most underlying and functional activities the plan of care focused on was improving her ability to walk using axillary crutches. Gait training has benefits towards both functional activity and cardiovascular conditioning. Referring back to Table 1.4, the patient was deconditioned to the point where ambulation of 10 ft. pushed the limits of her tolerance.
Initially, after short distance ambulation, her level of oxygen saturation would decrease quickly to the 86-90% range, while her heart rate would spike to 115-120 bpm. Gait training was performed once daily, 6 times a week, for fifteen minutes of each session. With daily treatment sessions, she began making considerable progress by the third week. Her ambulation distance increased to 30 ft. prior to fatigue, and the patient exhibited better balance and muscular control. By the completion of care, the patient ambulated approximately 70 feet prior to fatigue and spikes in vitals. This was in part due to patient education on importance of physical therapy, safety, and maintaining a positive attitude during treatment. The patient used a gait belt with a two person contact guard for the first 1-2 weeks of therapy, then progressed to one person contact guard, and eventually stand-by assist by the completion of treatment. The patient also was asked to maneuver around certain obstacles that would mimic a home setting during the higher level gait training. Overall, the functional gains made and the level of weight loss would indicate this was an effective method of treatment.

Cardiovascular Training

In addition to gait training improving fitness levels, cardiovascular exercise was also performed with an aim to decrease body fat percentage and risk factors, and improve overall quality of life. Cardiovascular exercise has been shown by numerous research studies to have positive effects.
toward what treatment was aimed to achieve. With this patient, an Omni
cycle exercise bicycle was the method of cardiovascular exercise. Studies
have shown it can be as effective as conventional exercise training\(^9\). This
type of intervention is appropriate for patients who cannot safely and
effectively perform higher level interventions. With the patient seated in her
wheelchair, she performed 15 minutes of lower extremity exercise, followed
by 15 minutes of upper extremity conditioning. Her overall vitals were during
treatment using a pulse oximeter to ensure patient safety and monitor
exertion. This intervention was performed daily for each of the 7 weeks of
patient care. Initially, the patient was only able to perform this intervention
on level 1 at 57% activity. By the end of week three, she was able to
perform at level 2 with 78% activity. Once the seventh week of treatment
commenced, the patient had improved all the way to level three at 94%
activity. Overall, her gains in cardiovascular function were a marked
improvement which had lasting effects on therapy outcomes.

**Balance/NeuroMuscular Re-Education Training**

In addition to the primary interventions, balance and neuromuscular
re-education training was performed once the patient was safely able to
achieve this higher level of function. Research indicates it is important for
deconditioned patients to bear weight through the limbs for strengthening
purposes and to prevent atrophy\(^10\). This exercise was performed daily in the
final two weeks of treatment inside the parallel bars. Fifteen minutes was
dedicated towards alternate stepping, with 10 repetitions on each lower extremity. Once again, vitals were monitored using a pulse oximeter to ensure safety during exercise. The improvements in just two weeks were essential to help retrain the muscles of the lower extremity which had been severely deconditioned after years of limited use. Although muscle strengthening was not re-assessed with regularity due to not being the primary focus of care, during week six the patient had improved to 4+/5 in all bilateral upper extremity and lower extremity manual muscle testing. This increase in muscle strength helped facilitate improved balance during ambulation and other functional activities\textsuperscript{11}.

Table 2.1: Intervention Summary

<table>
<thead>
<tr>
<th>Week</th>
<th>Gait Training</th>
<th>Bed Mobility</th>
<th>Transfers</th>
<th>Cardiovascular</th>
<th>Balance/Neuro-Re-Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(Initial Exam)</td>
<td>10 feet</td>
<td>Max. Assist x2</td>
<td>Max. Assist x2</td>
<td>Level 1 @ 57% activity</td>
<td>Not tested</td>
</tr>
<tr>
<td>2</td>
<td>15 feet</td>
<td>Mod. Assist</td>
<td>Max. Assist</td>
<td>Level 1 @ 96% activity</td>
<td>Not tested</td>
</tr>
<tr>
<td>3</td>
<td>30 feet</td>
<td>Min. Assist</td>
<td>Min. Assist</td>
<td>Level 2 @ 78% activity</td>
<td>Not tested</td>
</tr>
<tr>
<td>4</td>
<td>50 feet</td>
<td>Min. Assist</td>
<td>Min. Assist</td>
<td>Level 2 @ 98% activity</td>
<td>Not tested</td>
</tr>
<tr>
<td>5</td>
<td>60 feet</td>
<td>Contact guard</td>
<td>Contact guard</td>
<td>Level 3 @ 60% activity</td>
<td>Not tested</td>
</tr>
<tr>
<td>#</td>
<td>Distance</td>
<td>Guard</td>
<td>Activity</td>
<td>Steps</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------</td>
<td>-------</td>
<td>----------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>65 feet</td>
<td>Contact guard</td>
<td>Level 3 @ 86% activity</td>
<td>10 steps bilaterally</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>70 feet</td>
<td>Stand-by Assist</td>
<td>Level 3 @ 94% activity</td>
<td>10 steps x 2 bilaterally</td>
<td></td>
</tr>
</tbody>
</table>

**Outcomes:**

Outcome measures are important to achieve another measure of effectiveness of the interventions and treatment plan. The two outcome measures used were the TUG (timed up-and go) test, as well as the NPRS, or Numeric Pain Rating Scale. Both outcome measures are widely used and supported by research. The TUG test produced adequate test-rest reliability (0.56), excellent Interrater Reliability (.04 seconds difference). Minimum detectable change and minimal clinically important difference were not established. Minimum Detectable Change was a change of 3 points for the NPRS. MCID was a decrease in 1.14 points on the NPRS. The test retest reliability was adequate (0.63) for assessing the patient once a week. Referring to Table 2.2, these tests were administered either weekly or bi-weekly to assess progress. The TUG scores improved overall at each re-assessment, eventually to a level of 14.32. This would indicate the patient is at a low risk for falls and can safely ambulate short distances. The NPRS was assessed at each session, and the week’s overall scores were averaged to
assign one number per week. Table 2.2 indicates the level of pain the patient experienced did not significantly decrease, however did make minimal to moderate improvements to a level of 6/10.

**Table 2.2: Outcomes Summary**

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUG (seconds)</td>
<td>19.84</td>
<td>N/A</td>
<td>16.12</td>
<td>N/A</td>
<td>15.01</td>
<td>N/A</td>
<td>14.34</td>
</tr>
<tr>
<td>NPRS</td>
<td>9/10</td>
<td>9/10</td>
<td>8/10</td>
<td>8/10</td>
<td>7/10</td>
<td>6/10</td>
<td>6/10</td>
</tr>
</tbody>
</table>

In terms of goals, the patient achieved each milestone of short term and long term goals set forth. Therapists provided encouragement to achieve each goal in the allotted timeframe, and the patient was determined to work hard to improve. Also, the patient expressed she didn’t not want to disappoint, and focused on improving her quality of life. In the therapists’ professional opinion, the patient was displaying marked improvements and benefitting greatly from physical therapy treatment.

**Discussion/Conclusion:**

The purpose of this study was to examine the outcomes using a cardiovascular based treatment program for a 65 year old deconditioned patient with complications resulting from morbid obesity. Treatment for this patient was functionally based as well. Interventions included gait training,
cardiovascular training, bed mobility and transfer training, and balance/neuromuscular training. The aim of treatment was to promote weight loss, improve cardiovascular function and quality of life, and decrease risk of serious medical conditions stemming from being morbidly obese. Based on the data, patient response and adherence to treatment, and positive outcomes, this is an effective plan of care for patients with complications from morbid obesity. However, at times, things outside of the control of the physical therapist need to be addressed in order to move forward.

One factor other than physical therapy which may have affected treatment are psychosocial issues\textsuperscript{14}. The patient did occasionally have a day in which she was not in good spirits, which is understandable for someone with her condition. One could empathize with the patient when she described she was feeling depressed or upset. She also missed her infant granddaughter, as well as her children and her husband. However, I believe the thought of being around them was a positive motivating factor during her care. Another treatment issue is the fact that patient is currently covered by Medicare, which can have profound effects on coverage and therefore treatment\textsuperscript{15}. Effects include cap restrictions on therapy, exemptions for the obese, among others.

Limitations of this case report include only have one subject for which to base my conclusions upon. ROM and strength were not regularly assessed after initial examination, due to focusing treatment on more pertinent issues. However having that information would have strengthened my conclusion as
well. Therapists felt the patient was unsafe or unable to perform many of the other outcomes measures which may have improved construct validity of this study.

Further research may be warranted to further validate my assertion that these interventions are both appropriate and effective for morbidly obese patients. For example, earlier intervention in studies may have produced better outcome results. Also, having a patient who was able to perform other outcome measures would boost my conclusion as well. There may also be different strategies to treating patients with morbid obesity, and some research supports the efficacy of accelerated training\textsuperscript{16}. There can be different methods of ultimately attaining the same goal.

The conclusion of this treatment plan having beneficial results is warranted based on the data, patient response and adherence to treatment, and positive outcomes.

References


