The Role Of Physical Therapy In The Treatment And Discharge Of An Elderly Homeless Patient With Fractures Of The T12-L1 Vertebrae: 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.

The author acknowledges Brian Swanson, PT, DSc, OCS, FAAOMPT, for assistance with case report conceptualization and Lauren G. Roy, PT, MSPT, for supervision.
Abstract

Background and Purpose: On any given day there are over 600,000 homeless persons in the United States. Many homeless people sustain injuries directly resultant of their living situations and are treated at local hospitals. Following medical stabilization, many times hospitals encounter difficulties with discharging homeless patients. This case report examines the role of Physical Therapy in one such case in the context of direct patient care and collaboration with the interdisciplinary team for safe patient discharge.

Case Description: The patient was a 77 year old homeless male who sustained compression fractures to his T12 and L1 vertebrae after falling from a 4 foot height. The decision was made to treat the fractures non-surgically using a Thoracic Lumbar Sacral Orthotic (TLSO). The patient presented with deficient range of motion (ROM) in his bilateral lower extremities limited by pain, and good strength and coordination throughout both his upper and lower extremities. The patient initially presented as a high fall risk, per the Tinetti Balance and Gait Assessment, and scored within normal cognitive functioning per the Montreal Cognitive Assessment (MoCA).

Outcomes: The patient's self-reported pain levels decreased, his bilateral lower extremity range of motion increased, and he scored as a low fall risk per the Tinetti. Following treatment at the hospital, the patient was discharged to an inpatient rehab facility for further recovery because he could not return safely to his current living situation.

Discussion: Hospitals often run into difficulties when discharging homeless patients. A major obstacle is lack of patient compliance. Successful outcomes for homeless patients requires constant, open communication among the interdisciplinary healthcare team, and between the healthcare providers and the patient.
**Background and Purpose**

On any given day there are over 600,000 homeless persons in the United States.\(^1\) Homeless people have higher rates of premature mortality than the rest of the population, especially from unintentional injuries, and have an increased prevalence of mental disorders.\(^1,4\) Many homeless people sustain injuries directly resultant of their living situations, and are treated at local hospitals.\(^1,2\) Following medical stabilization, many times hospitals encounter difficulties with discharging homeless patients to a lower level of care.\(^1\) The risk for potential legal action and poor portrayal by the media is great if a homeless patient claims he/she was discharged improperly.\(^3\) Hospitals cannot discharge homeless patients to other facilities unless those facilities agree to take them, which often they do not for various reasons, such as lack of insurance or other means to pay for services.\(^2,5\) There are no easy solutions to these problems; they require creativity and collaboration on the part of interdisciplinary teams at hospitals.\(^2\) This case report examines the role of Physical Therapy in one such case in the context of direct patient care and collaboration with the interdisciplinary team for safe patient discharge.

**Case Description**

The patient was a 77 year old homeless male, who reported living out of his car with his girlfriend and dog after being evicted from his apartment one year ago for violating the terms of his rent. The patient was admitted to the hospital for treatment of compression fractures to his T12 and L1 vertebrae, sustained after falling from a 4 foot wall. He received X-ray imaging which revealed compression fractures to his T12 and L1 vertebrae. The patient also presented with a superficial abrasion with bruising to his left forehead, and an absence of protective wounds to his hands and forearms. He received computed tomography (CT) imaging to his head region which revealed no internal injuries. Overall, the patient was in good health, did not smoke (quit 30 years ago), did not drink (quit 24 years
ago), and reported regular physical activity including daily walking and calisthenics. Except for a myocardial infarction sustained eleven years ago with a coronary artery bypass graft, the patient presented with minimal comorbidities. After primary medical stabilization of the patient, the decision was made to treat the fractures non-surgically using a Thoracic Lumbar Sacral Orthosis (TLSO). The patient's goals for physical therapy were to have minimal/no pain, and to ambulate with a normalized gait pattern so as to return to his previous lifestyle and level of function.

**Clinical Impression 1**

The initial clinical impression of the patient was that he was limited in functional mobility and deficient in range of motion and balance, both due to pain secondary to the confirmed fractures of his thoracolumbar vertebrae. This presentation also led to the suspicion of balance deficits secondary to pain and decreased thoracolumbar range of motion. Despite negative findings from CT imaging, cognitive impairments were also suspected on account of the patient's head wound, especially since he lacked any protective wounds to his hands or forearms, findings which were inconsistent with the patient-reported history. It was determined that the patient would be administered gross strength testing to determine if any deficits in strength were present, balance testing (Tinetti balance assessment), a gross gait assessment to determine the presence of any gait deficits, and a cognitive screening (MoCA) to determine if any cognitive deficits were present. The initial prognosis was that the patient would progress through therapy and be discharged to an inpatient rehab facility.

**Examination**

Before any screenings were administered, Physical Therapy collaborated with Case Management to determine what data would be most helpful when presenting the patient's case to potential inpatient rehab facilities. The patient's medical diagnosis was compression fractures of the T12 and L1 vertebrae,
which was confirmed by x-ray imaging. Per the Tinetti mobility assessment, the patient initially
presented with balance impairments, and therefore use of a rolling walker assistive device was
indicated. Upon evaluation, the patient was found to have 5/5 strength within his available range
throughout his bilateral lower extremities. Occupational Therapy confirmed that the patient had 5/5
strength in his bilateral upper extremities. Strength testing was performed to establish a baseline
function, and to determine if the patient had any strength deficits secondary to his vertebral injuries.
Occupational Therapy also administered the MoCA on which he scored 26/30 which is considered
normal cognitive functioning. The MoCA was administered to rule out any cognitive impairments
sustained secondary to the patient's head injury. With his TLSO the patient was independent with bed
mobility, modified independent with supine to sit transfer, and modified independent with sit to stand
transfer (using upper extremities for assistance with transfers). The patient was able to maintain static
standing balance with eyes closed for greater than 20 seconds, and ambulated using a rolling walker
with stand-by supervision. The patient displayed good judgment with regard to his condition, and
demonstrated adequate understanding of spinal precautions. A baseline for the patient's perceived level
of pain was established using a Visual Analogue Scale (VAS) in order to evaluate improvements in
patient pain perception as treatment progressed. Based on the patient's diagnosis and evaluation, the
patient's prognosis for recovery was excellent to achieve his goals of returning to ambulating with no
impairments, and returning to his previous living situation after completion of inpatient rehab.
According to the American Academy of Orthopaedic Surgeons, patients who have sustained
compression fractures of the spinal column and who also receive non-surgical treatment with a brace
tend to avoid post injury problems with increasing physical activity and participation in rehab. Therefore the outlined plan of care and selection of interventions were developed to ensure the patient's
medical stability while in the hospital and to prepare the patient for inpatient rehab after discharge. See
Table 1 for further details regarding tests and measures.
**Clinical Impression 2**

The patient presented with deficient range of motion in his bilateral lower extremities limited by pain, and good strength (5/5) and coordination (grossly observed) throughout both his upper and lower extremities within his available range. The patient initially presented as a high fall risk, per the Tinetti Mobility Assessment. Based on the examination data obtained through the patient interview, strength testing, and the Tinetti balance and gait assessment, the patient presented with deficits in bilateral lower extremity strength and range of motion, in cognition with regard to geographical orientation and recall of recent events (as observed during the initial PT evaluation), and in balance. These findings were consistent with x-ray imaging as interpreted by the referring physician. The patient was designated as weight bearing as tolerated status, therefore the next plan of action was to proceed with physical therapy interventions. The plan for this patient was for him to be seen daily for one PT session lasting 30-45 minutes each, Monday-Friday until discharge. Within each session, the therapist planned to work with the patient in any or all of the following areas: balance retraining, safety awareness, gait training, ambulation for endurance, assistive device training, brace management, bed mobility, and transfer training. The therapist planned to reassess the patient using the tests and measures used during the initial evaluation at the 5th and 10th PT encounters.

**Intervention**

According to Alexandru and So, conservative management of spinal compression fractures involves gradual mobilization with use of an external orthosis. Younger patients tend to tolerate earlier mobilization better than older patients, thus elderly patients tend to require more bed rest, predisposing them to venous thrombosis and pulmonary embolism. Therefore it is critical to encourage mobilization in elderly patients with spinal compression fractures being managed with external orthoses.
After initial education was provided to the patient, the teach-back method was utilized to ensure patient understanding and retention of new/novel concepts. Teach-back was utilized on the two days following initial education to ensure patient retention of new knowledge and to re-evaluate the patient's memory. The patient's ambulation distance was increased each session to improve his ambulation tolerance and to increase his time spent out of bed to prevent deconditioning, hospital acquired pneumonia, and deep vein thrombosis. Therapeutic exercise was modified per patient tolerance to positional changes and to increased exertion. This was done to ensure that the patient would be able to tolerate an inpatient rehab regimen of therapeutic exercise. See Table 2 for details regarding interventions performed and treatment progressions.

Daily notes were entered into the hospital's electronic medical record regarding the patient's initial evaluation, daily treatments, and day-to-day Physical Therapy recommendations to be accessed by all members of the patient's healthcare team. On-going communication with the patient was conducted to assess his progress with therapy and his discharge goals. The patient was educated in: spinal precautions (log rolling only, no bending at the waist while in standing, no twisting of the thoracolumbar spine), the nature of his condition/deficits, exercise and ambulation program to increase blood flow and strengthen musculature surrounding impaired vertebrae and also to prevent deconditioning while in the hospital, a stretching regimen to increase mobility and reduce pain, functional bed mobility (up/down, roll left, roll right, supine to sit, sit to supine), use of the rolling walker assistive device, hospital safety protocols, Physical Therapy role and Physical Therapy recommendations. The patient was also educated in TLSO brace management to include: application and removal of brace and need for assistance with these activities, need to perform daily skin inspections to avoid integumentary breakdown, and cleaning and upkeep. The patient demonstrated compliance with, and adequate understanding of all education given to him. During the course of the patient's treatment, coordination was conducted with the attending physician to confirm the order of the
TLSO and spinal precautions; Occupational Therapy for concurrent assessment of present level of function and current functional limitations, and brace management; Nursing for medication schedule and instruction for brace management; Case Management to determine the patient's options post discharge and what goals the patient needed to meet which were required by specific inpatient rehab facilities and transportation services.

Case Management played a larger role than usual in this patient's course of care. The patient was medically stable at the time of discharge and therefore had the right to leave the hospital against medical advice. It is not uncommon for homeless patients to opt for discharge to the street,\textsuperscript{2,3} and this decision can put hospitals at risk for poor portrayal by the media\textsuperscript{2,3} and possible legal action if the homeless patient claims that he/she was improperly discharged.\textsuperscript{2} Early on in his case it became apparent to Physical Therapy that this patient would become medically stable relatively quickly and would no longer require skilled care in the hospital setting. It was also apparent that if he wanted his vertebrae to heal properly, the patient could not be discharged to his current living situation - homeless and living out of his car - due to the use of the TLSO and the spinal precautions to which he was required to abide. During daily rounds, Physical Therapy updated the interdisciplinary team on the patient's continuing progress. After each session with the patient, Physical Therapy met with Case Management to discuss the patient's post-discharge needs weighed against his current options. Physical Therapy communicated to Case Management that the patient required an inpatient rehab facility, however many such facilities were unable to accept the patient due to his lack of insurance. The only facility which would accept him was over 100 miles away, which compounded the discharge plan with the issue of transportation, as transportation costs typically are paid out of pocket by the patient.\textsuperscript{1,5} It took the combined effort of Case Management, Occupational Therapy, and Physical Therapy to convince the patient to agree to go to the rehab facility instead of discharging himself back to the street. By the time of his discharge, the patient indicated that he was comfortable with his decision and that it
was the best course of action for him to take.

**Outcome**

The patient remained in acute care for three days, after which point he was discharged to an inpatient rehab facility. The patient was discharged because he was medically stable and no longer required skilled care in the hospital setting. The patient was ambulatory at a modified independent level using a rolling walker for upper extremity support. The patient also reported reduced pain levels on the visual analogue scale, and scored within the low fall risk range on the Tinetti Balance and Gait Assessment. See Table 1 for details.

**Discussion**

All told, the patient spent a total of three days at the hospital, during which time he excelled at his physical recovery and was deemed safe for discharge for his diagnosis of two compression fractures to his lumbar spine. However, there were other aspects to the patient's case which did not progress as linearly. The patient presented with bruising and abrasions to his left supra-orbital forehead region. The wound was cleaned and dressed at the hospital. This wound was consistent with the patient's story of falling from a 4 foot high wall. The patient presented with no protective wounds to his hands or forearms. If the patient received the wound on his head from his fall, there is no evidence that he attempted to break his fall or protect himself in any way. In a study by Rogoz and Burke, it was found that older people experiencing homelessness in wealthy countries generally perform poorly on tests of frontal lobe functioning, including the 21-item Depression Anxiety Stress Scale. The patient was administered the MoCA, and did score within the range of normal cognitive functioning, albeit at the very bottom cutoff point. The MoCA was administered as an additional assessment, secondary to the CT scan, for traumatic brain injury, but he was not assessed specifically for depression. According to
Dierckx et al., caution should be taken when using the MoCA for detection of depressive symptoms. According to the Substance Abuse and Mental Health Services Administration, roughly 30% of chronically homeless people have mental health conditions, such as depression, and over 60% of people who are chronically homeless have experienced mental health problems in their lifetimes. Given that the patient scored within normal cognitive functioning on the MoCA, no additional action was taken regarding the patient's mental status.

Typically a patient at such a high level of function following conservative management of a spinal compression fracture would be discharged home, not to an inpatient rehab facility. However, given that the patient was homeless, this was not an option. His post hospital care required multiple factors which were not at his disposal in his current living situation: he did not have a bed on which to lie supine (he was a very tall gentleman, so he could not utilize the back seat of his car as a substitute for a bed), and his means of shelter, i.e. his car, would not allow for him to abide by his spinal precautions, nor would it allow him adequate space to perform proper brace management, e.g. donning and doffing. According to the American Academy of Orthopaedic Surgeons, vertebral compression fractures normally take between six and eight weeks to heal, given adequate immobilization of the affected segments. This patient would have been unable to adhere to his spinal precautions and perform proper brace management while living out of his car. The Physical Therapy department at the hospital recognized this dilemma and therefore made the recommendation to Case Management that the patient be discharged to an inpatient rehab facility. Unfortunately the closest rehab facility that would take the patient was in another city over 100 miles away. Nevertheless, the Case Management department obtained a bed for the patient at that facility along with medical transportation. Furthermore, the interdisciplinary team, particularly Physical Therapy and Case Management, was able to help the patient decide that inpatient rehab was his best option, thus avoiding potential complications from trying to heal from his injuries in a homeless environment.
References


10: Available at:

### Table 1

<table>
<thead>
<tr>
<th>Tests and Measures</th>
<th>Initial Evaluation Results</th>
<th>Final results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tinetti Balance and Gait Assessment</td>
<td>Balance score: 8/16, Gait score: 6/12, Total: 14/28, indicates high fall risk</td>
<td>Balance score: 14/16, Gait score: 10/12, Total: 24/28, indicated low fall risk</td>
</tr>
<tr>
<td>Manual Muscle Testing (within available range)</td>
<td>5/5 strength throughout both upper extremities and both lower extremities</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Visual Analogue Scale (VAS) Pain Level</td>
<td>At rest: 6/10, With activity: 8/10</td>
<td>At rest: 4/10, With activity: 6/10</td>
</tr>
<tr>
<td>Montreal Cognitive Assessment (MoCA)</td>
<td>26/30, indicates normal cognitive function</td>
<td>Not assessed</td>
</tr>
</tbody>
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### Table 2

<table>
<thead>
<tr>
<th>Intervention 1 Patient education</th>
<th>Rx Day 1</th>
<th>Rx Day 2</th>
<th>Rx Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educated patient on brace management, spinal precautions, hospital safety protocols, use of rolling walker</td>
<td></td>
<td>Utilized teach-back of education from Rx Day 1 to ensure patient comprehension and retention</td>
<td>Utilized teach-back of education from Rx Day 1 to ensure patient comprehension and retention</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention 2 Durable medical equipment</th>
<th>Rx Day 1</th>
<th>Rx Day 2</th>
<th>Rx Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provided patient with TLSO, assisted patient with application and removal, performed skin inspection</td>
<td>Assisted patient with application and removal, performed skin inspection</td>
<td>Assisted patient with application and removal, performed skin inspection</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention 3 Functional mobility</th>
<th>Rx Day 1</th>
<th>Rx Day 2</th>
<th>Rx Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructed patient in general bed mobility, instructed patient in transfers, ambulated with patient using rolling walker 40 ft x 2</td>
<td>Ambulated with patient using rolling walker 100 ft x 4</td>
<td>Ambulated with patient using rolling walker 100 ft x 6</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention 4 Therapeutic exercise</th>
<th>Rx Day 1</th>
<th>Rx Day 2</th>
<th>Rx Day 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>In supine: heel slides, straight leg raises, ankle pumps: 10 reps x 3 sets each.</td>
<td>Sitting at edge of bed: sitting marches, long arc quads, heel raises: 10 reps x 3 sets each. In supine: passive glute/hamstring</td>
<td>In standing with rolling walker: marches, mini squats, hip abduction, heel raises: 10 reps x 4 sets each. In supine: self-stretch of glute/hamstring using bed sheet</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>stretches: 3 sets x 30”</td>
<td>3 sets x 30”</td>
</tr>
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