



# Promoting Participation in the Presence of Peril

## *Collaborative Intervention by a Physical Therapist and Nurse Practitioner in a Patient With Cervical Spine Metastasis*

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Physical activity has been increasingly recognized as a valuable supportive intervention in patients with end-stage disease. Furthermore, despite the presence of terminal disease, patients may desire interventions that promote an optimal level of mobility. For patients with metastatic cancer in the upper cervical spine, functional activity involves the possibility of pathologic fracture and resulting respiratory failure. The following case describes a high-risk, patient-centered intervention in a patient who desired transfer training despite a pathologic lesion in the second cervical segment and paraplegia from a pathologic fracture of the fourth thoracic vertebrae. The intervention was successfully delivered through collaborative efforts of a physical therapist and nurse practitioner with support of the hospice interdisciplinary team. Although the patient was not able to meet his goal because of disease-related complications, the interventions provided a sense of hope for the patient and family and highlight the importance of interprofessional collaboration in the management of complex patients in a hospice setting.

ical activity program, beginning with the ability to get out of bed.<sup>1</sup> For patients with metastases to the spine, mobility goals may involve the risk of vertebral fracture with resultant spinal cord compression. In such cases, the safety and comfort of mobility-related interventions may be optimized by cotreatment between a nurse and a physical therapist.

### The Role of the Hospice Physical Therapist

The physical therapist's role in hospice and palliative care has been well described and typically involves interventions to reduce pain, improve comfort, and optimize mobility within the limits of the patient's disease or condition.<sup>3-5</sup> In 2008, the Medicare Conditions of Participation were expanded to include the requirement for physical therapy services to be made available in the hospice setting and provided according to accepted standards of practice.<sup>6</sup> Despite this requirement, the physical therapist is not considered a member of the hospice interdisciplinary team (IDT), and consults for their services can originate from many sources, including members of the IDT or the patient and family.

Typical consults are centered upon a specific patient need and may include requests for bed positioning, family education for patient home safety, or training for appropriate use of an assistive device. Although expectations for improvement of function are not at the forefront of physical therapist intervention in hospice, such gains can occur through the judicious titration of training frequency and intensity. Accordingly, Briggs<sup>7</sup> describes 5 physical therapy practice models for use in hospice and palliative care. The appropriate physical therapy practice pattern is determined by the patient's condition, comorbidities, and progression. *Rehabilitation in reverse* is the most common model in end-of-life care, involving interventions and education, which prepare patients and families for safe and optimal mobility in the presence of a progressive decline in function. This pattern is often used with patients in the early to middle stages of amyotrophic lateral sclerosis or other neurodegenerative disease. *Rehab light* involves a program of decreased intensity interventions delivered less frequently (ie, once a week). This pattern is often used for debilitated patients who desire a small improvement in function, such as transferring to a bedside commode. *Supportive care* involves the use of comfort measures for

### KEY WORDS

hospice care, patient-centered care, physical therapy, spinal metastasis

Interventions supporting the optimization of functional mobility are often desired by patients with end-stage disease.<sup>1,2</sup> A recent study of patients with advanced cancer receiving palliative care suggested that declining physical function, particularly the loss of walking ability, is associated with lower subjective scores of quality of life.<sup>2</sup> Furthermore, evidence suggests that patients with terminal disease rank optimization of function as a foremost concern, and many express the desire to participate in a phys-

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pain and edema such as massage, gentle range of motion, and guided imagery for relaxation. This pattern is used for patients who are functionally dependent as in end-stage cancer or amyotrophic lateral sclerosis. Finally, *case management and skilled maintenance* provide oversight of functional status and mobility through intermittent reassessment, along with training and education of the patient and family to ensure safety and optimal function, again typically at a lower intensity and frequency compared with standard rehabilitation programs. This pattern is often used when a patient and their family are able to practice mobility skills safely and independently and require physical therapist visits on an “as needed” basis.

As with all physical therapist services, hospice-related interventions are provided following a thorough assessment of body systems and functional activities. Activities of daily living, muscle strength, range of motion, and cardiopulmonary endurance are evaluated in order to determine the patient's physiologic capabilities related to the functional goal at hand.<sup>8</sup> Comorbidities involving other body systems are also considered when determining appropriate patient interventions.

### Metastatic Renal Cancer

Renal cell carcinoma is the fifth most common cancer in men and the second most common death from cancer worldwide.<sup>9</sup> Osseous metastases occur in 50% of patients with renal cell cancer, with 15% occurring in the spine.<sup>10</sup> It is estimated that each year 5%, or 61 000, of all patients with cancer will develop spinal metastasis, which is typically managed through palliative measures aimed at reducing pain, limiting local disease progression, maintaining spinal stability, and preventing spinal cord compression.<sup>10</sup> Severe pain is the most common presenting sign of spinal metastasis and is typically managed through a course of palliative radiation. Palliative radiation has been shown to reduce pain in up to 70% of cases and may also assist in preventing localized disease progression.<sup>10</sup>

Severe spinal metastasis may lead to vertebral body collapse and neurologic compromise. Spinal cord compression occurs in 5% to 14% of patients with spinal metastases and is associated with an average survival of 3 to 7 months.<sup>10</sup> Depending on the location and extent of the metastatic lesion, surgical decompression can be accomplished through either a posterior laminectomy or vertebrectomy with reconstruction. The use of stabilizing hardware may be contraindicated in the presence of multiple areas of spinal metastasis. In cases of acute onset of spinal cord compression, the preservation of ambulatory ability has been shown to be the strongest predictor of postsurgical capability.<sup>10</sup> The patient in this case reported to the emergency department (ED) with lower-extremity paralysis, which remained unchanged after decompression surgery.

## METHODS

The information used for this case was extracted from a review of the patient's medical chart as well as the clinical documentation of the physical therapist and nurse practitioner/attending provider. Further information was extracted from conversations with the hospice clinical director, the patient, and his wife. Both authors collaborated on the case description and in the writing of this article. This case was approved by the Northern Arizona University Institutional Review Board.

## CASE DESCRIPTION

The following case describes an unusually high-risk, patient-centered intervention delivered through the collaborative efforts of a physical therapist and nurse practitioner/attending provider in a hospice setting. Donald (names in this case were changed to ensure anonymity) was a 36-year-old Native American man with renal cell carcinoma and extensive bony metastasis to the spine resulting in T4 paraplegia. Radiographic evidence of a lesion in C2 raised significant concerns around Donald's request for a hospice physical therapy consult for bed-to-wheelchair transfer training. This case was unique in that it required interventions to improve Donald's quality of life along with measures to ensure comfort in the event of a fatal outcome occurring during the intervention itself.

Donald initially received the diagnosis in February 2014 after presenting to the ED with severe left flank pain. A computed tomography scan revealed evidence of renal cell carcinoma, and Donald underwent a left nephrectomy with clear margins that was hoped to be curative. He subsequently returned home to live with his wife, Roxanne, and their 4 sons who were between the ages of 7 and 15 years. He also resumed his work as a forklift operator in a large warehouse.

Two months later, Donald returned to the ED, reporting the sudden onset of severe lower left flank pain while brushing his teeth. A computed tomography scan found osseous metastatic disease in the left iliac bone and sacroiliac joint. In addition, further metastases were found in the left acetabulum, left lateral 6th rib, and posterior 11th rib. Following consultation, Donald was admitted to the hospital palliative care service for supportive pain management and initiation of chemotherapy. After a 1-week inpatient admission, Donald returned home and resumed full-time work with modified responsibilities because of use of opioid medication for pain control.

Despite aggressive management, Donald's back pain continued, and a follow-up magnetic resonance imaging (MRI) in April revealed metastases to the lungs as well as lytic lesions of the sacrum and coccyx, left posterior iliac wing, T7, and C2. Three months later, Donald presented



again to the ED complaining of sharp right shoulder pain after turning to his side in bed. An MRI revealed a stress fracture of the distal right clavicle as well as further metastatic disease in the lumbar and thoracic vertebrae. A course of palliative radiation was initiated, targeting both the right clavicle and spine.

In the early fall of 2014, Donald began to notice lower-extremity weakness and difficulty assuming standing from sitting. On October 7, Donald's legs suddenly gave out while walking to the restroom, and he sustained a ground-level fall. He presented to the ED with complaints of severe pain and weakness in both legs. An MRI showed collapse of the T4 vertebra with spinal cord compression and pathologic fractures of both femurs. Donald underwent open reduction/internal fixation of bilateral femurs. Posterior laminectomies of T3 to T6 were also performed in the hope of relieving spinal cord compression and restoring lower-extremity function. Despite this surgical effort, Donald continued to demonstrate paraplegia at the T4 level. In addition to Donald's cancer-related morbidities, his history of rheumatoid arthritis, gastrointestinal hemorrhage, chronic anemia, and morbid obesity (BMI of 35 kg/m<sup>2</sup>) further challenged his mobility and endurance. Nevertheless, despite these concerns, Donald had continued to work full time until this point.

Donald was discharged to a hospice assisted-living facility but went home with hospice and family care after a 10-day stay. There was continued coordination of care by the hospital palliative care program's nurse practitioner who served as the attending provider for the hospice team. After remaining in bed for several days, Donald and Roxanne requested delivery of a wheelchair. This request was initially delayed for 1 week because of the hospice team's concerns about a potentially fatal fracture of C2 during its use. Adding to the concern, Donald's pain and general weakness precluded the ability to transfer effectively, and his bedroom was too small to accommodate the use of a Hoyer lift. The attending provider and nurse case manager discussed these concerns with Donald and Roxanne who expressed their desire for wheelchair delivery despite the potential risk. Although the wheelchair was then delivered, Donald remained in bed for the next 3 months because of pain, weakness, and general deconditioning. Pain management continued to be a primary goal and remained problematic despite the use of methadone, fentanyl patches, hydromorphone, and lorazepam for pain-related anxiety.

Donald grew increasingly despondent over his lack of mobility. In late January 2015, Donald and Roxanne requested a hospice physical therapy consult for transfer training to optimize social interaction and improve psychological outlook. Once again, the hospice clinical director expressed concern over the possibility of a fatal C2 fracture during physical therapy intervention; however, both Donald and Roxanne expressed the desire to proceed after

education regarding such risk. The following day, the hospice IDT recommended a joint visit with the hospice physical therapist and Donald's attending provider, the latter of whom was prepared to administer an injection of hydromorphone and/or midazolam (5 mg subcutaneously or intravenously every 15 minutes, followed by 1 mg per hour as needed as determined by Donald's prior level of tolerance to both medications) to ensure patient comfort in the event of respiratory failure from a C2 fracture. Donald had previously elected do-not-resuscitate status upon his admission to hospice and had expressed the desire to die at home.

### INTERVENTION

The visit took place at Donald's home on January 27, 2015. The physical therapist explained the treatment procedure and received Donald's consent. The attending provider assured Donald and Roxanne that he would be made comfortable with an injection of hydromorphone and/or midazolam if respiratory distress/failure occurred. Donald and Roxanne agreed to the intervention. Donald had recently taken his pain medications in preparation for the visit, and his vitals were stable. He reported back pain at 3/10 level.

A cervical collar was placed on Donald in supine. He was log rolled by the attending provider and physical therapist for placement of a blanket under his head, trunk, and pelvis. Once Donald was in side-lying position, his head and trunk were fully supported as the head of his bed was raised to vertical. Donald's legs were moved to the floor into a weight-bearing position, and Donald was assisted to sitting with assistance of the 2 clinicians. Standing in front of Donald, the physical therapist used the blanket around head, shoulders, and trunk to distribute forces across these areas once he assumed sitting, and the attending provider supported Donald from behind. He was able to sit with partial weight bearing on both arms for 3 minutes before his back pain and fatigue interfered. Donald's wife Roxanne observed treatment and was offered the opportunity to practice. She declined over concern about increasing Donald's pain and fatigue but expressed confidence that she would be able to follow through with the assistance of a family member. Of note, Roxanne was a nurse assistant who had been trained in bed mobility procedures. Roxanne was also encouraged to contact the physical therapist for a return visit to assist her initial attempt at moving Donald to the upright position if needed.

Donald was severely deconditioned after being in bed for 3 months. Furthermore, he also had decreased respiratory function and limited trunk control from his paraplegia. Therefore, it was important for him to develop a functional sitting tolerance before safely proceeding to transfer training. Therefore, it was agreed that Donald would need at least 2 weeks of daily practice in order to develop the sitting tolerance and balance required to begin working with a



sliding board. Donald and Roxanne were instructed to assist Donald with sitting at the edge of the bed with the assistance of a family member, working up to a minimum of 10 minutes. He was also instructed to practice accepting increasing upper-extremity support to prepare for the use of a sliding board. Finally, Donald was instructed to work within his pain tolerance and to wear his cervical support during the procedure.

## OUTCOMES

The next visit took place 2 weeks later at Donald's bedside with the physical therapist and attending provider. During that visit, Donald noted that he had developed a respiratory infection that precluded sitting but stated that he was still determined to meet his transfer goal. During the third and final visit 2 weeks after the previous, Donald was tearful and appeared to be coming to terms with his imminent death. Nevertheless, he stated that he had not given up on his goal.

During the next month, Donald experienced increasing back and leg pain, which prevented him from assuming a sitting position. He also developed a moist cough and was unable to mobilize secretions. Donald also began to experience swallowing difficulty and shooting pains in his arms, which were followed by a sensation of cold. Donald's attending provider continued weekly visits for pain management and communicated with the physical therapist by telephone. Pain control continued to be problematic. Despite the use of atropine for secretion management, fentanyl, methadone, and lorazepam, Donald reported a consistent pain level of 6/10. Nevertheless, Donald refused palliative sedation as a pain control option in order to verbally interact with family members. On March 10, following a visit to Donald's home, the attending provider documented that he had "likely aspirated and/or his lytic C2 lesion was fracturing and compressing the spinal cord." This documentation also indicated that he was actively dying. Four days later, Donald's breathing became increasingly shallow, and he died within minutes. Roxanne was present. In a telephone conversation with the physical therapist shortly after Donald's death, Roxanne stated that he was able to squeeze her hand and tell her that he loved her. She further stated that Donald had been encouraged by the hospice team and physical therapy plan of care, which provided a sense of meaning. She expressed gratitude that the hospice team was willing to support Donald's goal. Most importantly, Roxanne felt that he died with comfort and dignity.

The attending provider later reported that the cause of death was likely related to compression or transection of the spinal cord at the C2 level.

## DISCUSSION

This case highlights 2 issues that are worthy of consideration. The first pertains to the unusually high level of risk

inherent in the physical therapy intervention. Patient injuries as a result of physical therapy intervention are uncommon; death is very rare, and both are always unanticipated. Thus, the unambiguous risk of a patient's death due to physical therapy intervention is practically unheard of. According to the American Physical Therapy Association in 2015, 204 000 licensed physical therapists in the United States provided skilled interventions to patients at all points in the life span, in a variety of settings, largely without incident.<sup>8</sup> In 2010, Healthcare Providers Service Organization, the largest national underwriter of physical therapist professional liability coverage, published a 10-year study of all physical therapist liability claims exceeding \$10 000.<sup>11</sup> Of the 552 identified claims, 26% involved fractures occurring during physical therapy treatment, and 20% involved burns from improper use of modalities. In contrast, patient death was reported as 0.9%.

The second issue relates to the ethical considerations of this case. Donald requested 2 interventions that involved a high level of risk; the first was his request for a wheelchair for home use, and the second was his subsequent request for transfer training. Specifically, Donald's informed consent and explicit desire to proceed with a potentially fatal intervention constituted an ethical dilemma juxtaposing the bioethical principles of autonomy and nonmaleficence (do no harm). Like many patients with metastatic cancer, Donald had sustained several pathologic fractures. In this case, Donald's paraplegia from metastatic spinal fracture and his potential for collapse of C2 were unusual, as was his resolve to maintain the highest level of function despite such risk. Donald's resolve was clearly evident by his insistence in working full time while living with painful and debilitating metastatic disease and by his refusal of palliative sedation in order to verbally interact with this family. These observations suggest that hospice clinicians should be prepared to support patients with metastatic spinal lesions who remain invested in maintaining function in the face of the related risk.

The hospice IDT carefully considered the risks and benefits of these requests during Donald's team conference and ultimately supported his autonomy. Reconciling this dilemma required careful consideration by the hospice IDT who supported Donald's request as an affirmation of his autonomy and quality of life, while providing measures to ensure his comfort. The decision of the hospice IDT is well supported by ethicists in the area of end-of-life care who generally consider patient autonomy to be the paramount guiding principle in all care-related decisions.<sup>12</sup> Thus, the support of the hospice team was essential for the intervention to proceed as was the experience of the physical therapist and attending provider/nurse practitioner. In rare cases of high-risk intervention, hospice clinicians may support patient autonomy while lacking the confidence or skills to safely carry out the related treatment. In such





instances, collaboration with expert clinicians should be encouraged. The physical therapist and attending provider in this case were experienced clinicians (36 and 40 years, respectively; each with 10 years of hospice experience). Nevertheless, the IDT's recommendation for collaborative treatment between the physical therapist and attending provider provided instrumental support for both practitioners.

The support of the physical therapist and attending provider continued even when Donald was no longer able to pursue his goal. Both clinicians remained in contact with the patient and family to support the multifaceted elements of his end-of-life process, which facilitated a sense of meaning, validation, and death with dignity. Ethical principles honored included patient/family autonomy, beneficence, and nonmaleficence.

### CONCLUSION

Spinal metastases are a prominent feature in patients with renal cell carcinoma, occurring in 50% of cases.<sup>10</sup> Pathologic lesions of the high cervical spine may present the risk of fatal respiratory failure during the performance of simple daily activities. In the hospice setting, patients with cervical spine metastases may seek interventions to improve their function and quality of life even when educated of the risk. In such cases, the hospice team must consider the ethical implications, particularly patient autonomy, and identify optimal strategies for success, safety, and comfort. As illustrated in this case, cotreatment between the physical therapist and nurse practitioner (who was also the attending provider) can be an effective approach to patient and family support in the delivery of high-risk mobility interventions.

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