Clinical Reasoning and Advanced Practice Privileges Enable Physical Therapist Point-of-Care Decisions in the Military Health Care System: 3 Clinical Cases

Daniel I. Rhön, Gail D. Deyle, Norman W. Gill

Background and Purpose. Physical therapists frequently make important point-of-care decisions for musculoskeletal injuries and conditions. In the Military Health System (MHS), these decisions may occur while therapists are deployed in support of combat troops, as well as in a more traditional hospital setting. Proficiency with the musculoskeletal examination, including a fundamental understanding of the diagnostic role of musculoskeletal imaging, is an important competency for physical therapists. The purpose of this article is to present 3 cases managed by physical therapists in unique MHS settings, highlighting relevant challenges and clinical decision making.

Case Description. Three cases are presented involving conditions where the physical therapist was significantly involved in the diagnosis and clinical management plan. The physical therapist's clinical privileges, including the ability to order appropriate musculoskeletal imaging procedures, were helpful in making clinical decisions that facilitate timely management. The cases involve patients with an ankle sprain and Maisonneuve fracture, a radial head fracture, and a pelvic neoplasm referred through medical channels as knee pain.

Outcomes. Clinical pathways from point of care are discussed, as well as the reasoning that led to decisions affecting definitive care for each of these patients. In each case, emergent treatment and important combat evacuation decisions were based on a combination of examination and management decisions.

Discussion. Physical therapists can provide important contributions to the primary management of patients with musculoskeletal conditions in a variety of settings within the MHS. In the cases described, advanced clinical privileges contributed to the success in this role.
Physical Therapist Point-of-Care Decisions in the Military Health Care System

Physical therapists often are positioned to make point-of-care management decisions within their area of specialty training, most often musculoskeletal conditions. In the Military Health System (MHS), these management decisions can occur while the physical therapist is deployed in a combat support role, in addition to the more traditional hospital settings. Physical therapists in the MHS are often the first credentialed providers to examine and diagnose patients with musculoskeletal conditions. Formal clinical privileges to order basic laboratory and diagnostic imaging studies and refer patients to the laboratory and diagnostic imaging channels patients with injuries and conditions requiring treatment outside of a physical therapist’s scope of practice. Examples of pathology a physical therapist may encounter include tumors, infections, aortic abdominal aneurysms, fractures, dislocations, and a variety of other systemic diseases. Additionally, conditions such as cauda equina syndrome, stress fractures of the femoral neck, or compartment syndrome may require emergent surgical intervention. Injuries that disrupt joint surfaces or produce instability, such as Lisfranc or ankle syndesmosis injuries, have a better prognosis with timely recognition and early appropriate management. Although very uncommon, neoplasms also can masquerade as musculoskeletal pathology, as the skeletal system is a common site of metastasis for various primary cancers.

The purpose of this article is to present 3 cases where physical therapists in the MHS played roles in the diagnosis and clinical management and provide insight into their decision-making and clinical reasoning processes. Each case illustrates a focus on clinical decisions, including ordering diagnostic musculoskeletal images and implementing appropriate subsequent care.

Therapist and Environment Characteristics

The physical therapist providing care for the first 2 patients had a master's degree in physical therapy, 4 years of outpatient orthopedic experience in direct access settings, and formal credentials for advanced clinical privileges, including ordering musculoskeletal imaging and basic laboratory studies. These cases occurred during a 12-month combat deployment while serving in a forward operating base in Iraq, where the physical therapist served as the only imaging medium available for a convoy to the Combat Support Hospital a short flight away, where the closest surgeon was located. The medical personnel in the forward operating base included 2 physicians (internal medicine and family medicine specialties), a physical therapist, 2 physician's assistants, a dentist, a nurse, and a mental health provider. Although there were trauma, mass casualty, and evacuation protocols that were practiced by the medical team, none existed for the standard management of musculoskeletal injuries and conditions. Additionally, leaving the confines of the forward operating base for a convoy to the Combat Support Hospital was a dangerous and potentially life-threatening course of action and had to be weighed accordingly in the management decisions. Two of these cases were chosen from a file of cases brought back from a combat deployment, based on their musculoskeletal imaging application.

In the forward operating base, the front-line environment was austere, with limited medical resources, and the only imaging medium available was a small mobile radiography system. A computed tomography scanner was available in the Combat Support Hospital a short flight away, where the closest surgeon was located. The medical personnel in the forward operating base included 2 physicians (internal medicine and family medicine specialties), a physical therapist, 2 physician's assistants, a dentist, a nurse, and a mental health provider. Although there were trauma, mass casualty, and evacuation protocols that were practiced by the medical team, none existed for the standard management of musculoskeletal injuries and conditions. Additionally, leaving the confines of the forward operating base for a convoy to the Combat Support Hospital was a dangerous and potentially life-threatening course of action and had to be weighed accordingly in the management decisions. Two of these cases were chosen from a file of cases brought back from a combat deployment, based on their musculoskeletal imaging application.

Physical Therapist Point-of-Care Decisions in the Military Health Care System

Physical therapists often are positioned to make point-of-care management decisions within their area of specialty training, most often musculoskeletal conditions. In the Military Health System (MHS), these management decisions can occur while the physical therapist is deployed in a combat support role, in addition to the more traditional hospital settings. Physical therapists in the MHS are often the first credentialed providers to examine and diagnose patients with musculoskeletal conditions. Formal clinical privileges to order basic laboratory and diagnostic imaging studies and refer patients to the laboratory and diagnostic imaging channels patients with injuries and conditions requiring treatment outside of a physical therapist’s scope of practice. Examples of pathology a physical therapist may encounter include tumors, infections, aortic abdominal aneurysms, fractures, dislocations, and a variety of other systemic diseases. Additionally, conditions such as cauda equina syndrome, stress fractures of the femoral neck, or compartment syndrome may require emergent surgical intervention. Injuries that disrupt joint surfaces or produce instability, such as Lisfranc or ankle syndesmosis injuries, have a better prognosis with timely recognition and early appropriate management. Although very uncommon, neoplasms also can masquerade as musculoskeletal pathology, as the skeletal system is a common site of metastasis for various primary cancers.

The purpose of this article is to present 3 cases where physical therapists in the MHS played roles in the diagnosis and clinical management and provide insight into their decision-making and clinical reasoning processes. Each case illustrates a focus on clinical decisions, including ordering diagnostic musculoskeletal images and implementing appropriate subsequent care.

Therapist and Environment Characteristics

The physical therapist providing care for the first 2 patients had a master's degree in physical therapy, 4 years of outpatient orthopedic experience in direct access settings, and formal credentials for advanced clinical privileges, including ordering musculoskeletal imaging and basic laboratory studies. These cases occurred during a 12-month combat deployment while serving in a forward operating base in Iraq, where the physical therapist served as the only imaging medium available for a convoy to the Combat Support Hospital a short flight away, where the closest surgeon was located. The medical personnel in the forward operating base included 2 physicians (internal medicine and family medicine specialties), a physical therapist, 2 physician's assistants, a dentist, a nurse, and a mental health provider. Although there were trauma, mass casualty, and evacuation protocols that were practiced by the medical team, none existed for the standard management of musculoskeletal injuries and conditions. Additionally, leaving the confines of the forward operating base for a convoy to the Combat Support Hospital was a dangerous and potentially life-threatening course of action and had to be weighed accordingly in the management decisions. Two of these cases were chosen from a file of cases brought back from a combat deployment, based on their musculoskeletal imaging application.

In the forward operating base, the front-line environment was austere, with limited medical resources, and the only imaging medium available was a small mobile radiography system. A computed tomography scanner was available in the Combat Support Hospital a short flight away, where the closest surgeon was located. The medical personnel in the forward operating base included 2 physicians (internal medicine and family medicine specialties), a physical therapist, 2 physician's assistants, a dentist, a nurse, and a mental health provider. Although there were trauma, mass casualty, and evacuation protocols that were practiced by the medical team, none existed for the standard management of musculoskeletal injuries and conditions. Additionally, leaving the confines of the forward operating base for a convoy to the Combat Support Hospital was a dangerous and potentially life-threatening course of action and had to be weighed accordingly in the management decisions. Two of these cases were chosen from a file of cases brought back from a combat deployment, based on their musculoskeletal imaging application.
Case Descriptions

Case 1 (Maisonneuve Fracture)

Patient history and systems review. A 38-year-old Hispanic male physician's assistant reported that he was on a combat foot patrol in Iraq when he "stepped wrong" and twisted his right ankle. He reported immediate pain that increased with weight bearing, but he was able to continue the patrol. After 30 minutes, due to increasing pain, he was placed in a vehicle and returned to the forward operating base for further evaluation by medical staff. He denied any low back, hip, or knee pain, and all of his vital signs were normal. He was not currently on other medications. He was able to take 4 steps with some weight distributed on his right lower extremity, although he winced from pain. Upon removal of his boots, there was obvious ankle effusion on the right compared with the left. The attending physician in the trauma room cleared the foot and ankle for lacerations, wounds, or other irregularities and verified neurovascular integrity. A radiographic study of the ankle (Fig. 1) was ordered in the trauma triage room and read verbatim as a "possible avulsion of medial malleolus but otherwise unremarkable." It was unknown whether the Ottawa Clinical Decision Rule was used before ordering the radiograph. He was provided crutches, a compression wrap, and instructions to ice and elevate the ankle. Two days later, after the swelling had slightly subsided, he came in to see the physical therapist for additional care.

Clinical impression 1. The otherwise healthy patient was using crutches, tolerating partial but not full weight bearing. Moderate joint effusion and ecchymosis over the lateral ankle were still present. The physical therapist's plan was to rule out a fracture, and if a fracture existed, to determine whether surgical stabilization was required (which would require an evacuation out of the country). The physical therapist's differential diagnosis included: medial collateral (deltoid) or lateral collateral ligament ankle sprain, rearfoot or midfoot sprain (Lisfranc or Charcot), and high ankle (syndesmosis) sprain (Table). Unique considerations for prognosis included the need to ambulate on rocky terrain while wearing body armor (~8 kg). The decision to consult with an orthopedic surgeon would not be trivial, as it required an escorted caravan of vehicles on a hostile route. This patient case demonstrates some unique considerations of managing a patient with a musculoskeletal injury in a combat environment, including an assessment of resources and implications of clinical decisions on further care and prognosis.

Examination. The physical therapist used the Ottawa Ankle Rule to screen the patient for a fracture, even though a radiograph had already been taken. The rules indi-
**Table.**
Clinical Reasoning Summary for All Cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Differential Diagnosis</th>
<th>Differentiation Pointa</th>
<th>Management Plan</th>
<th>Outcome</th>
</tr>
</thead>
</table>
| Maisonneuve fracture | 1. Lateral collateral ligament ankle sprain  
2. Syndesmosis (high ankle) sprain  
3. Proximal fibula fracture | Mechanism of injury. Sharp pain on medial malleolus and proximal fibula with palpation. Inability to fully bear weight in single-limb stance due to pain. | Discussion with orthopedic surgeon in remote location. Surgical intervention usually required for this condition. Patient was evacuated out of theater for surgical consideration. | After 2 weeks of immobilization, and based on minimal pain and minimal widening with proper stress views of the ankle, the decision was made to manage the fracture nonsurgically. The patient returned to the combat theater 4 months later. |
| Radial head fracture | 1. Elbow contusion  
2. Radial collateral ligament sprain  
3. Radial head dislocation  
4. Olecranon fracture | Mechanism of injury, joint effusion, fracture-quality pain, and inability to fully extend the elbow. Fat pad sign seen on radiograph. | Discussed with orthopedic surgeon the nature of the fracture (articular surface). Based on age and work demands, recommendation was made to evacuate patient out of theater for surgical fixation. | Based on status and function of patient on further evaluation, decision was made to manage the fracture nonsurgically. Patient was able to return to theater because the physical therapist was able to manage him there. By 14 weeks, patient was able to do 10 push-ups pain-free. |
| Hip neoplasm        | 1. Tumor; malignant or benign  
2. Infection  
3. Pelvic inflammatory disease  
2. Early satiation  
3. Bowel changes  
4. Bladder changes  
5. Menstrual irregularity  
Palpable fullness in the right anterior pelvic region | Screening radiographs ordered by physical therapist at initial visit revealed aggressive malignant process. | Same-day evaluation by orthopedic oncologist initiated plan for differential diagnosis and definitive care. |

a Differentiation point marks critical aspects from the examination leading to the decision to order diagnostic imaging. The results could have a significant impact on determining the intervention plan.

dicate that radiographs are necessary only if there is any pain in the malleolar zone along with the presence of at least 1 of these 3 factors: (1) bone tenderness along the distal 6 cm of the posterior edge of the tibia or tip of the medial malleolus, (2) bone tenderness along the distal 6 cm of the posterior edge of the fibula or lateral malleolus, or (3) inability to bear weight both immediately after the injury and for at least 4 steps in the emergency department. The sensitivity for ruling out a fracture without the need of a radiograph if these factors are not present is 100%. However, these rules have not been validated in a combat setting. The patient was putting partial body weight on his foot, but it caused significant pain and discomfort. Tenderness was elicited with palpation of the lateral malleolus. Gentle ligamentous stress tests (talar tilt and anterior drawer) were inconclusive due to pain. Additionally, their value as conclusive diagnostic tests for ligament disruption is questionable due to poor reliability. In order to provide a thorough evaluation, the entire fibula was carefully palpated for a possible fracture and compressed against the tibia as a provocative assessment of the syndesmosis, suggestive of a positive test for syndesmotic injury (kappa = 0.50), although it should not be relied on alone for the diagnosis. This intervention reproduced the patient’s pain. Palpation to the proximal fibula produced sharp pain, even without a provocative squeeze. Joint mobility assessment of the forefoot and mid-foot joints did not reproduce any pain. The Achilles tendon was intact, and resisted straight planar flexion was not painful. A mild forced external rotation force to the leg and foot reproduced pain in the medial and lateral ankle, in addition to the proximal lateral leg. The medial malleous also was tender. The physical therapist evaluated the radiographs taken 2 days prior, but the proximal fibula was not visualized in that particular image (Fig. 1). The differential at this point included a syndesmotic sprain versus a proximal fibula fracture, with the potential for a concurrent medial ankle sprain or fracture. He placed the patient non-weight bearing on crutches with an immobilizer boot and ordered repeat radiographs.
Physical Therapist Point-of-Care Decisions in the Military Health Care System

Figure 2.
The combination of a proximal fibular fracture (often indicating injury to the syndesmosis) and medial malleolar fracture can predispose the talocrural joint to significant instability and often requires surgical fixation. (A) The fracture of the medial malleolus was more evident on anterior-posterior view than in the oblique (mortise) view in Figure 1. (B) Exposure of the entire leg revealed a fracture of the proximal diaphysis of the fibula.

Clinical impression 2. The physical therapist evaluated the new images and visualized a spiral fracture of the proximal fibula in addition to a fracture of the medial malleolus (Fig. 2). These findings were consistent with the clinical examination and the diagnosis of a Maisonneuve fracture.30,31

Outcome. The injury had been assessed as thoroughly as permitted in that clinical setting. The decision was made to medically evacuate the patient to the United States for further evaluation by an orthopedic surgeon at a large Army hospital. The decision, based on the rocky terrain and instability of the ankle from the Maisonneuve fracture, was in the best interest of the patient. An injury of this nature without proper treatment could result in greater disability. The diagnosis may have been missed without the additional radiographic images of the knee and proximal fibula. After several weeks of rest and proper immobilization during the transition back to the United States, the injury showed early callus formation and minimal widening of the mortise with proper stress imaging (radiographs and fluoroscopy). The surgeon decided to treat the well-positioned fracture conservatively with a short leg cast in a non-weight-bearing status for 6 additional weeks.

Discussion. Maisonneuve fractures are easy to misdiagnose.30-31 A comprehensive clinical examination that assesses areas above and below the area of symptoms can make misdiagnosis less likely. Examination of ankle injuries should include assessment of adjacent joints,52 in this case, careful palpation of the fibula51,53 and the bones of the foot, in addition to the malleoli. The areas above and below the area of primary symptoms should be assessed for less obvious injury and potentially related or referred pain. Maisonneuve fractures occur as a result of an external rotation injury to the ankle (often causing medial malleolus pathology) whose force is transmitted up through the interosseous membrane, ultimately resulting in a fracture of the proximal fibula. The proximal fibular fracture, in isolation, can in many cases be managed nonsurgically.55 However, some medial malleolar fractures and deltoid ligament sprains may result in significant ankle instability, requiring surgical fixation.55-56 Because of these possible complications and the austere medical setting, the physical therapist decided to have the patient medically evacuated. Once back in the United States, the orthopedic surgeon decided that due to optimal initial management and good joint stability, the best option was to continue treating the fracture conservatively with immobilization. Had the fracture been missed originally, the patient may have displaced his fracture, creating greater instability and a need for surgery, leading to a longer period of disability. In this case, optimal early management by the physical therapist may have contributed to the surgeon’s decision to forgo surgery and return the soldier to the combat theater later that year.

Case 2 (Radial Head Fracture)
Patient history and systems review. A 21-year-old Caucasian male soldier was seen by the physical therapist with a complaint of right elbow pain after a fall sustained while playing basketball several hours earlier. The pain was primarily in the posterior-lateral elbow, and the patient was unable to fully
extend his elbow because of the pain. The patient denied any symptoms in the neck, shoulder, or hand, other medical issues, or prior history of elbow injury. The soldier was 3 months into his 1-year deployment in Iraq, hoping to remain in theater with his unit. After initial triage in the trauma room to rule out other injuries, the patient was sent to the physical therapist for a thorough evaluation of the elbow.

**Clinical impression 1.** The soldier presented with his arm in a sling, and he was fully alert and oriented to the situation. He denied hitting his head or any symptoms in the wrist, shoulder, or neck but reported his lateral elbow pain as 9/10 on the numeric pain rating scale. Despite the swelling, he was willing to take his arm out of the sling, but guarded his elbow against full elbow extension.

**Examination.** Gentle palpation produced intense pain on the posterior lateral aspect of the elbow. There was visible elbow effusion, and pain limited full elbow extension. There was neurovascular integrity of the distal forearm and hand. Shoulder range of motion was full and pain-free. The physical therapist decided to order a set of anterior-posterior and lateral view radiographs of the elbow in order to rule out a fracture. The inability to fully extend the elbow (elbow extension test) has been associated with a 50% likelihood of fracture.\(^{57}\) Alternately, full extension of the elbow can rule out a fracture with a sensitivity of 98.4% (negative likelihood ratio of 0.03).\(^{57}\) The patient was instructed to continue wearing the sling, monitor his neurovascular status, use ice, elevate the upper extremity, and report back the next day. The physical therapist reasoned that even if a fracture were present (Table), it would be better to wait at least 24 to 48 hours to allow the effusion to diminish before casting or splinting the elbow.

**Clinical impression 2.** In the absence of a radiologist or orthopedist, the physical therapist initially evaluated the radiographs. A radial head fracture, later categorized as a Mason grade II, was identified spanning through the articular surface and coursing the length of the radial head (Fig. 3).\(^{38-40}\) The Mason classification system for radial head fractures is: (1) type I—nondisplaced fracture of the radial head; (2) type II—marginal radial head fracture with minimal displacement, depression, or angulation; and (3) type III—comminuted radial head fracture.\(^{40}\) Although the reliability of the classification system has been called into question,\(^{59}\) it has been shown to be one of the more reproducible classification systems (intrarater kappa = 0.58, interrater kappa = 0.43-0.56).\(^{41}\) The patient returned after 72 hours, reporting decreased pain of 0/10 at rest and 3/10 when moving the elbow. The effusion had decreased substantially, and the therapist placed the patient in a plaster-fabricated long-arm cast in elbow flexion and full forearm supination.

**Outcome.** Due to the nature of the fracture involving the articular surface, the physical therapist presented the case to an orthopedic surgeon at a larger Combat Support Hospital using e-mail to send him the radiographic images. In this particular case, the surgeon felt that surgical evaluation was appropriate; therefore, the patient was evacuated to a hospital outside the combat theater. Ultimately, because the fracture was minimally displaced and the patient was already showing promising signs of recovery, the fracture was managed nonsurgically in a long-arm cast. The patient requested to return to the combat theater, despite medical evacuation orders stating, "Patient will need conservative treatment unavailable in theater due to his job." Subsequently, the soldier's case manager contacted the physical therapist on the base in Iraq to determine whether the patient could receive conservative care there. The
Physical Therapist Point-of-Care Decisions in the Military Health Care System

PI: Constant, slightly variable, fatiguing, deep ache to sharp 8-10/10

P2: Intermittent intense tingling

Figure 4.
Body chart or map of patient-reported symptoms. PI represents the worst or most severe area of symptom reported by the patient. Cleared areas were determined by touching the area and asking the patient whether she was experiencing any symptoms in this location. Check marks indicate symptom-free areas.

physical therapist confirmed that the soldier's fracture could be managed there, and the soldier was able to return to Iraq.

Discussion. The articular surface involvement of the radial head fracture required evaluation by an orthopedic surgeon. Management of this type of fracture can be conservative^2 or surgical, depending on age or functional demands of the patient. The outcome often can be favorable without surgery.^4 Evidence for surgical versus nonsurgical care for a Mason type II radial head fracture remains inconclusive. A recent systematic review showed there was insufficient evidence from which to draw firm conclusions. After the surgeon decided on nonsurgical treatment, the physical therapist was able to help manage the patient in the combat theater. At 6 weeks, radiographs revealed incomplete healing, so the physical therapist transitioned to partial immobilization by fabricating a splint that could be removed for active-assisted range-of-motion exercises in the physical therapy clinic. By 14 weeks, there was adequate union, and the patient was able to complete 10 push-ups without pain. Ultimately, the soldier was able to finish his entire deployment in Iraq.

Case 3 (Tumor Case)

Patient history and systems review. A 21-year-old African American female college student with right knee, thigh, and hip region symptoms was referred to a physical therapist at a large MHS academic medical center. Although the patient had received prior medical attention for a variety of signs and symptoms associated with her condition, the physical therapist’s diagnostic hypothesis shifted the focus to examining structures of the hip and pelvic region, including radiographic studies, which revealed an aggressive malignant neoplasm.

The patient attended college and worked nights in a convenience store. She denied regular physical or athletic activity, a specific mechanism of injury, or a change in her work-related duties. She had been seen in the medical center adolescent clinic on 3 occasions during the previous month for right hip and knee pain. The prescribed naproxen did not provide appreciable symptom relief. A contrast bowel study performed due to her recent history of difficult bowel movements was unremarkable. No imaging of the pelvis, hip, or thigh had been obtained. The referral diagnosis from the physician in the adolescent clinic was patellar tendinitis. Her primary complaint was a constant, slightly variable ache to sharp pain (10/10 at worst) with intermittent intense tingling that extended from the anterior pelvic region distally to the anterior knee (Fig. 4). The symptoms were severe enough to keep her from getting more than 1 hour of sleep per night. Her pain was most intense when squatting, lifting her leg to get out of the car or shower, moving her leg for braking while driving, and while standing to operate the cash register at work. During health screening, she indicated that she was experiencing a decreased capacity for food, urgency and frequency of urination, difficulty initiating bowel movements, and menstrual irregularity. She also indicated general health changes of fatigue and malaise.

Clinical impression 1. The patient/client history indicated that injury or overuse influencing the musculoskeletal system was not likely. The onset, progression, behavior, and severity of symptoms were atypical for a musculoskeletal condition. Additionally, the “red flags” of early satiation,^1^ consistent difficulty with bowel movements, urinary urgency,^4^ changes in menstrual regularity,^6^ and general health changes suggested the possibility of pathology outside the musculoskeletal system and possibly within the genitourinary or lower gastrointestinal...
Physical Therapist Point-of-Care Decisions in the Military Health Care System

The physical therapist planned a careful examination of the pelvic region, hip, thigh, and knee.

**Examination.** Her pain at rest in a standing position was 8/10. The patient’s gait was antalgic, and she walked on her forefoot on the painful side with a flexed hip and knee. Active attempts to straighten the hip and knee in a standing position increased the pain to 10/10. During supine examination, the knee could reach full passive extension when the hip was slightly flexed without increasing her knee pain. Knee flexion was equal to the contralateral side and did not increase her pain if the hip was held stable. No ligamentous instability was noted at the knee. There were no typical signs of infrapatellar tendinitis such as swelling or crepitus, but there was vague palpation tenderness over the anterior aspect of the infrapatellar tendon. By disrobing the patient to her undergarments and carefully palpating the pelvic region, fullness in the right anterior lateral pelvic region was appreciated, with pain over the superior pubic ramus and anterior ipsilateral hip. Hip passive range of motion was limited by pain in all directions. Resisted strength tests of the foot and ankle were 5/5, but those of the hip and thigh were weak and painful.

**Clinical impression 2.** Due to the atypical history, including several red flags, and the abnormal examination findings in the pelvic and hip region, the physical therapist decided additional screening was indicated. She selected an initial screening strategy of plain film radiographs to be followed as necessary by the appropriate screening laboratory studies such as an erythrocyte sedimentation rate and complete blood cell count and advanced imaging. The thigh and knee seemed to be minimally involved. The physical therapist ordered an anterior-posterior and lateral view radiographic study of the pelvis, which also would reveal hip structures.

**Outcome.** A highly aggressive, destructive lesion was identified on the radiographic images involving the right superior pubic ramus and right acetabulum (Fig. 5A). The musculoskeletal radiologist’s report stated that a Codman’s triangle (a triangular periosteal bone formation) was present along the medial surface of the right ilium with aggressive periosteal reaction. This finding has been reported in other tumors of the pelvis. The radiologist’s initial differential diagnosis included telangiectatic osteosarcoma and infection. The radiologist contacted the physical therapist recommending a magnetic resonance imaging (MRI) scan and a bone scan. The physical therapist immediately notified the orthopedic oncologist on call, who contacted the patient. The subsequent MRI study revealed a lytic bone lesion that had completely destroyed the right superior pubic ramus (Fig. 5B). A large necrotic soft mass displacing the bladder and rectum likely accounted for the bowel and bladder changes and early satiation the patient had experienced. Ultimately, upon receiving definitive cancer treatment, the diagnosis was a malignant peripheral nerve sheath tumor, a class of sarcoma.

**Discussion.** This patient presentation was identified as atypical by a physical therapist who routinely examines patients with musculoskeletal problems. Accurately completing the body chart or symptom map helped focus the examination to the hip and pelvic region (Fig. 4). The patient interview helped identify red flags and changes associated with two major body systems. Tenderness at the knee was most likely referred pain from the involved somatic structures in the pelvic region, a well-documented phenomenon. The intense tingling may have been caused by the peripheral nerve sheath pathology. The physical therapist facilitated the diagnosis with a thorough examination of the patient, including an appropriate imaging screening strategy. The physical therapist’s credentials to order the appropriate musculoskeletal imaging...
helped facilitate a more timely diagnosis.

Outcomes

The 3 cases in this report describe select patient management processes in these various clinical settings within the MHS. Point-of-care clinical decision pathways and relevant clinical reasoning affected definitive care for each of these patients (Table). Urgent intervention and immediate medical evacuation decisions in these cases were possible, in part, because of the physical therapists’ full scope of relevant clinical privileges. The value of an appropriately tailored examination, combined with the skills and credentials to perform simple screening tests such as musculoskeletal imaging when indicated, was illustrated.

Discussion

Physical therapists in the MHS often serve the role of musculoskeletal specialists, many times being the first credentialed provider to evaluate and diagnose these patients. These cases illustrate examples of decision-making and clinical reasoning processes by physical therapists in the MHS and augment similar reported cases in this setting. The year that the physical therapist served in Iraq was the first year that physical therapists were organically and routinely placed within Brigade Combat Teams to provide advanced musculoskeletal care closer to the point of injury (cases 1 and 2). There was little precedence for physical therapists working at this level in the combat theater; however, preliminary data suggest that other members of the medical team highly value their musculoskeletal expertise. Future research should evaluate outcomes for military units with and without physical therapists as part of their teams. These cases exemplify the potential advantages of early involvement by physical therapists with appropriate clinical privileges, and they add to the body of literature describing progressive clinical practice patterns of physical therapists.

All authors provided concept/idea/project design and writing. Dr Rhon and Dr Deyle provided the patient cases. Dr Deyle and Dr Gill provided consultation (including review of manuscript before submission).

The views expressed are those of the authors and do not reflect the official policy of the Department of the Army, the Department of Defense, or the US Government.


References


