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## Physical Therapy in the Emergency Department: Development of a Novel Practice Venue

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## Physical Therapy in the Emergency Department: Development of a Novel Practice Venue

Debra Fleming-McDonnell, Sylvia Czuppon, Susan S. Deusinger, Robert H. Deusinger

D. Fleming-McDonnell, PT, DPT, is Assistant Professor, Physical Therapy and Orthopaedic Surgery, Program in Physical Therapy, Washington University School of Medicine, Campus Box 8502, 4444 Forest Park Blvd, Suite 1101, St Louis, MO 63108 (USA). Address all correspondence to Dr Fleming-McDonnell at: [flemingd@wusm.wustl.edu](mailto:flemingd@wusm.wustl.edu).

S. Czuppon, PT, MS, is Instructor, Physical Therapy and Orthopaedic Surgery, Program in Physical Therapy, Washington University School of Medicine.

S.S. Deusinger, PT, PhD, FAPTA, is Professor, Physical Therapy and Neurology, Program in Physical Therapy, Washington University School of Medicine.

R.H. Deusinger, PT, PhD, is Associate Professor, Physical Therapy, Medicine, and Orthopaedic Surgery, Program in Physical Therapy, Washington University School of Medicine.

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**Background and Purpose.** The American Physical Therapy Association's Vision 2020 advocates that physical therapists be integral members of health care teams responsible for diagnosing and managing movement and functional disorders. This report details the design and early implementation of a physical therapist service in the emergency department (ED) of a large, urban hospital and presents recommendations for assessing the effectiveness of physical therapists in this setting.

**Case Description.** Emergency departments serve multiple purposes in the American health care system, including care of patients with non-life-threatening illnesses. Physical therapists have expertise in screening for problems that are not amenable to physical therapy and in addressing a wide range of acute and chronic musculoskeletal pain problems. This expertise invites inclusion into the culture of ED practice. This administrative case report describes planning and early implementation of a physical therapist practice in an ED, shares preliminary outcomes, and provides suggestions for expansion and effectiveness testing of practice in this novel venue.

**Outcomes.** Referrals have increased and length of stay has decreased for patients receiving physical therapy. Preliminary surveys suggest high patient and practitioner satisfaction with physical therapy services. Outpatient physical therapy follow-up options were developed. Educating ED personnel to triage patients who show deficits in pain and functional mobility to physical therapy has challenged the usual culture of ED processes.

**Discussion.** Practice in the hospital ED enables physical therapists to fully use their knowledge, diagnostic skills, and ability to manage acute pain and musculoskeletal injury. Recommendations for future action are made to encourage more institutions across the country to incorporate physical therapy in EDs to enhance the process and outcome of nonemergent care.



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The hospital emergency department (ED) has become a common entry point into the health system for individuals with urgent, but noncritical, care needs.<sup>1</sup> Estimates project that more than 80% of people seen in EDs have non-life-threatening conditions, many involving chronic pain.<sup>2</sup> Physical therapy intervention in the ED has been suggested to positively influence patient satisfaction and pain management for acute low back pain (LBP)<sup>3</sup> and to shorten waiting time for referral to outpatient care.<sup>4</sup> However, few studies have demonstrated the impact physical therapy could have in managing nonemergent patient cases, thus reducing unnecessary hospital admissions, costs, waiting time, elopement and frequent returns, and improvement of patient satisfaction and outcomes. Although physical therapist practice in the ED has been reported in a few locations in the United States,<sup>4</sup> most reports regarding this practice paradigm are from other countries.<sup>3-6</sup>

Traditionally, EDs have relied exclusively on nurses and physicians (MDs) whose short-term provider relationship with patients and training for emergent care may make managing acute and chronic pain difficult.<sup>7</sup> As new roles have emerged in health care, advanced nurse practitioners (NPs) and physician assistants (PAs) have been integrated into the ED culture to improve care of patients with nonemergent conditions. Griffin and Melby<sup>8</sup> demonstrated that NPs could be integrated effectively into the ED provider team as long as roles and responsibilities were clear and education and experience sufficiently enabled competence in this complex environment. Similarly, incorporating physical therapists into this setting requires the same careful personnel selection and role delineation. It also offers opportunities to enhance satisfaction of patients with

nonemergent conditions who are seen in the ED.

Because physicians' education focuses on diagnosing medical illness, MDs may not be adequately prepared to manage musculoskeletal conditions without prescribing medications or surgery. This situation may be exaggerated in the ED setting, where quickly relieving symptoms and determining referral routes to fully address patients' musculoskeletal problems are imperative.<sup>7</sup> As recently as 2003, DiCaprio et al<sup>9</sup> documented that nearly 50% of the 122 US medical schools required no training in musculoskeletal medicine. Childs et al<sup>10</sup> showed that physical therapists are better prepared to manage common musculoskeletal conditions seen in primary care than other medical practitioners, except orthopedic surgeons, who typically provide only consultation in most EDs. In any ED, it is essential to rapidly identify primary movement impairments and provide specific interventions to relieve pain and improve function. Studies support that physical therapists can be effective and safe in collaborating with other primary care team members in diagnosing and managing musculoskeletal and neuromuscular disorders.<sup>11</sup> This creates an ideal opportunity for partnership with other ED providers.

Managing pain conditions in the ED can become costly, especially because these conditions may result in multiple ED visits by patients needing more than a short-term solution.<sup>12</sup> Jorgensen<sup>13</sup> suggested that costs associated with ED management of nonmalignant back pain may be unnecessarily high, especially for patients returning repeatedly for the same condition, and concluded that ED physicians may not be sufficiently prepared to address the functional problems associated with acute or chronic pain. In a retrospective study of data from the National

Hospital Ambulatory Medical Care Survey (NHAMCS), Isaacs et al<sup>14</sup> found that 17.8% of patients with uncomplicated cases of LBP received unnecessary radiographs in the ED. Some authors have suggested that physical therapy intervention may be more cost-effective if more expensive options are avoided.<sup>11,15-17</sup> Daker-White et al<sup>11</sup> found the costs of managing specific musculoskeletal conditions by physical therapy to be less than if care was provided by an orthopedic surgeon because fewer radiographs were ordered or fewer referrals for surgery were made. Patients with chronic pain may wait longer in the ED due to their lower triage priority,<sup>18</sup> an indirect health care cost. Time limitations felt throughout the ED, attitudes toward patients who return repeatedly, and limited primary care options outside the ED may cause tests to be ordered or pain medications prescribed inside the ED as short-term solutions to patients' symptoms. These conditions invite including physical therapists into the provider team managing the myriad conditions seen in busy EDs.

Historically, physical therapists may have not initiated hospital ED services because of 2 concerns. The first concern is that serious medical conditions could be overlooked without MD involvement. Contemporary practice requires physical therapists to screen for conditions not amenable to physical therapy intervention by identifying signs of medical pathology that do not fit the



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patterns of musculoskeletal impairments.<sup>19</sup> Stowell et al<sup>20</sup> showed that physical therapists can independently distinguish medical conditions from problems of musculoskeletal origin and manage these pain problems in first-contact situations. Physical therapists have been able to associate complaints of LBP with medical pathologies, including endometriosis,<sup>21</sup> hip pain with lymphoma,<sup>22</sup> and hip pain and weakness with cervical cord compression.<sup>23</sup> Each case resulted in referral to a more appropriate practitioner. The second concern is that patients would be at greater risk for adverse events without being first screened by a physician. However, Moore et al<sup>24</sup> found no such risk in a pool of 50,799 patients. There were no reports of patient injury, adverse events, disciplinary action, revocation of licensure, or litigation. These results increase the confidence that physical therapists could be productive ED providers.

Managing nonemergent acute and chronic pain is a primary obligation for physical therapists.<sup>19</sup> A 2005 NHAMCS report documented a 23% increase in hospital ED visits over 10 years, despite a 15% decrease in the number of EDs operating nationally.<sup>1</sup> Patients with musculoskeletal sprains, strains, and neck and back injuries accounted for 13.9% of ED visits, a 2% increase from 2002.<sup>1</sup> These data suggest that EDs likely care for numerous patients with conditions appropriate for physical therapy intervention.

Using physical therapy in the ED increases patient satisfaction with management of LBP<sup>3</sup> and other musculoskeletal conditions compared to when NPs or MDs are involved.<sup>12,25</sup> Overall waiting times have been shown to decrease, even though patients may spend more time receiving care from a physical therapist.<sup>25</sup> When physical therapy is provided

in the ED, patients are more likely to be referred for further outpatient care,<sup>4</sup> creating the possibility of earlier return to work.<sup>26</sup> At least one study showed that outcomes of physical therapy intervention in the ED can last beyond the single intervention provided there. McClellan et al<sup>25</sup> showed that improved function and decreased pain persisted 1 month after physical therapy intervention in the ED. However, neither Lau et al<sup>3</sup> nor Richardson et al<sup>12</sup> found such benefits lasted beyond an acute phase, even though satisfaction with the one-time encounter was high. These findings suggest that managing acute and chronic pain is a continuous process requiring not only episodic care in the ED but also appropriate referral to achieve follow-up.<sup>18,27</sup>

The primary purpose of this administrative case report is to describe the process of establishing a physical therapy service in a busy urban ED. Preliminary outcomes and recommendations for further assessment of physical therapy impact on ED cost of care, length of stay, pain, and patient and practitioner satisfaction are presented.

### Target Setting

After several years of planning, we initiated a demonstration project to evaluate the feasibility of physical therapy services in the Barnes-Jewish Hospital (BJH) Emergency Department in St Louis, Missouri.<sup>28</sup> Barnes-Jewish Hospital is part of the Washington University Medical Center, which includes several collaborative components. Washington University School of Medicine (WUSM) provides all MDs, NPs, and PAs for this ED. All other personnel (eg, nurses, residents, orderlies) are hospital employees. Only WUSM physical therapy faculty practitioners participated in this demonstration project.

The 52,000-sq ft BJH ED hosts the only level 1 trauma center in St Louis and, in 2005, provided care to 62,000 patients.<sup>28</sup> The ED is divided into 4 separate areas associated with severity of medical presentation: trauma/critical care (12 beds), emergent care (31 beds), urgent care (12 beds), and observation (12 beds). Priority of care is determined through standardized triage processes that use indicators of urgency, manage patient waiting time, and identify nonemergent cases.<sup>29</sup> In the BJH ED, nurses are specifically trained to categorize patients by signs of acuity and health risk and determine priority of service. Placement in 1 of 5 triage categories (A=resuscitation, B=emergent, C=urgent, D=semi-urgent, E=nonurgent) reflects the number of resources (eg, laboratory work, imaging, specialty consults) each patient may require. Triage outcomes (eg, patients' complaints and status) are available electronically, enabling ED providers to track the progress of patients through examination and intervention procedures. Results of diagnostic tests (eg, imaging, hematology) and some documentation also are available electronically.

### Development of the Process

One author (R.H.D.) created the concept, secured the funding, developed the administrative infrastructure, and implemented the plan for this physical therapy service. Developmental steps over several years preceded service delivery and built visibility: (1) observing in the ED and communicating with university and hospital leadership, (2) testing provider acceptance, (3) analyzing projected volumes and staffing needs, (4) planning for assessment, and (5) presenting a final proposal.<sup>28</sup> Table 1 details activities related to these steps.

When this project was first envisioned in 2004, back pain was the

sixth most common complaint seen in this ED, accounting for 2,031 patients in that year. Combining this with other likely categories of musculoskeletal problems drawn from the top 75 chief complaints (totaling 10,737 patients),<sup>28</sup> potential encounters amenable to physical therapy management were estimated. This estimate reflected indicators from the literature<sup>5</sup> and information obtained from another Midwestern hospital with similar volumes that had implemented physical therapy services in the ED (personal communication, Pauline Flesch, February 2005). We projected that managing the resulting target volume (2,555 encounters or 4.3% of the top 75 chief complaints) could require at least a half-time staffing effort. A 3-day per week schedule was proposed with times that rotated each month so that all days could be tested for optimal service visibility. The proposal was presented to the BJH chief operating officer, who is responsible for ED management. Funding from hospital sources for salary, benefits, and supplies was requested. No requirements for developing billing services were built into the initial model. The WUSM Program in Physical Therapy leadership selected one of the authors (D.F.M.) to staff the ED because of her expertise in managing acute and chronic pain conditions; her experience in neuromuscular and musculoskeletal rehabilitation in inpatient, outpatient, and long-term care; and her ability to build collaborative networks in practice. These characteristics were viewed as critical, especially in the early phases of service implementation. The original proposal recommended evaluating effectiveness of patient care, patient waiting time, cost-effectiveness of care, and efficiency of the ED health care team (Tab. 2). Annual reports of these measures—or others if the original measures were not feasible

**Table 1.**  
Service Development Process<sup>a</sup>

Activity	Outcome
Observed triage and patient care	Selected times and days projected to be optimal for patient flow and staffing
Proposed service and its benefits to WUSM and BJH leadership	Discovered support from all levels of leadership
Surveyed physicians, nurses, residents, and physician assistants to test perceptions of physical therapy impact on ED culture	Received unanimous response that physical therapy could contribute to diagnosis, management, and follow-up of patients; some doubt about potential to decrease costs or waiting time
Analyzed data for proposal development	Projected volumes, costs to support initial full-time equivalent position and supplies
Selected assessment directions	Targeted volumes, referral source, encounter time and type, and patient satisfaction and disposition after ED discharge
Considered documentation formats	Designed initial and discharge forms
Presented case studies for attending physicians and residents to illustrate inclusion of a physical therapist as an ED provider	Identified providers willing to refer patients to a physical therapist and interested in understanding physical therapist's ability to assist in differential diagnosis

<sup>a</sup> WUSM = Washington University School of Medicine, BJH = Barnes-Jewish Hospital, ED = emergency department.

or meaningful—were pledged to hospital administration.

### Application of the Process

The service began with a funding commitment from BJH for the proposed half full-time equivalent position, a commitment that increased to one full-time equivalent position in the second year. This cost accounts for less than 1% of the entire ED budget. To assist in resident training, a series of abbreviated case studies were developed that illustrated the scope of interventions used and how physical therapists can assist in diag-

nostic and disposition decisions. Flexibility and patience were required to achieve sufficient visibility given the persistence of traditional triage processes and the need to continually educate providers who returned to those traditions at times when the physical therapist was off-site. Early signs of acceptance into the care team resulted in the ED creating an electronic physical therapy consult icon and inviting us to create a physical therapy documentation form for the new electronic medical record. Awareness of the service prompted ED clinicians to page the

**Table 2.**  
Outcome Measures Proposed

Outcome Target	Specific Measures	Method
Effectiveness of care	Initial and discharge pain	Analog pain scale Medication type/amount Frequency of returns
Patient waiting time	Time to triage and intervene	Patient satisfaction surveys Length of stay
Cost-effectiveness	Use of radiographs and medications	Radiographs for select diagnoses Medication timing during care pathway
Efficiency	Triage trajectories	Referral patterns Staff satisfaction surveys

## Physical Therapy in the Emergency Department

**Table 3.**

Case Examples of Patients Seen by Physical Therapist

Age (y)/Sex	Triage Category <sup>a</sup>	Chief Complaint	Imaging Prior to Physical Therapy	Physical Therapist Examination	Intervention
32/female	D	Ankle and foot pain after tripping. Second emergency department visit for same complaint.	Prior and current radiograph of foot: negative.	Foot and ankle screening inconclusive. Correcting fibular head alignment decreased symptoms.	Education, gait training, outpatient physical therapy referral.
55/male	C	Chest and shoulder pain, hand tingling after scaffolding fell onto shoulder. Cardiac issues and fractures ruled out.	Computed tomography of shoulder: negative.	Cervical screening reproduced symptoms.	Education, neck and shoulder postural correction, outpatient physical therapy referral.
22/male	B	Single-car accident, intoxicated; lost consciousness. Head and chest trauma ruled out. Knee pain.	Computed tomography of knee: negative.	Knee screening not consistent with primary musculoskeletal pain problem.	Referred back to physician. Magnetic resonance imaging showed complete tears of all knee ligaments and popliteus muscle. Hospital admission.

<sup>a</sup> Triage categories: B=emergent, C=urgent, and D=semiurgent.

physical therapist to provide telephone consultation when the physical therapist was not on-site. Relationships were built with BJH and WUSM information systems personnel to enable surveys of patient satisfaction and analysis of length-of-stay patterns in the ED.

### Preliminary Outcomes

The case examples shown in Table 3 demonstrate the types of patients seen in the ED and suggest how physical therapy can influence movement, function, pain management, and disposition in the emergent care setting. Between August 2005 and May 2007 (6 months of a half full-time equivalent position and 12 months of a full-time equivalent position), 316 patients were seen, with referrals highly variable from month to month. Most referrals (72%) occurred between 8:00 a.m. and 4:00 p.m.; MDs and NPs provided 93% of those referrals. Eighty-nine percent of referrals were from the emergent or urgent care areas of the ED. Between June 2007 and May 2008, 518 patients were referred (average of 1.98 patients per day), and between

June 2008 and May 2009, 565 patients were referred (average of 2.56 patients per day). Available data regarding the chief pain complaints of patients seen by the physical therapist in 2008 are presented in Table 4. This increase in consult requests reflects the gradual acceptance of the physical therapist by ED providers, particularly attending physicians.

Written feedback from ED personnel complimented the effective manage-

**Table 4.**

2008 Chief Pain Complaints of Patients Seen by Physical Therapists (n=422)

Chief Complaint	Percentage <sup>a</sup>
Back	43.6
Neck	11.6
Knee	11.6
Ankle and foot	8.8
Shoulder	8.3
Other	8.1
Hip	5.9
Hand and wrist	2.1
Elbow	0.5

<sup>a</sup> Total percentage exceeds 100% due to patients having multiple complaints.

ment of musculoskeletal pain, ability to provide follow-up resources, and contributions to differential diagnosis and disposition planning. Concerns were voiced only about the inability to provide services during all hours of ED operation. Patient perspectives, obtained using a short written survey and a telephone follow-up by BJH's customer satisfaction research team, suggested that physical therapy intervention helps patients learn to reduce pain and avoid subsequent problems of the same type. A more systematic test of patient satisfaction is required to make definitive conclusions about patient regard for physical therapy in the ED.

The complexity of the BJH ED environment, including financial reporting, staffing patterns of all providers, and documentation paradigms, limited our ability to comprehensively assess cost-effectiveness and service efficiency. However, length-of-stay data were tracked for patients who received physical therapy between 2005 and 2006. Compared with the average BJH ED length of stay of 6.3

hours, 50% of patients seen by the physical therapist showed a length of stay of less than 5 hours. Average encounter time with the physical therapist was 54 minutes (range= 15-105 minutes). The accuracy of this measure is complicated by the periodic interruption of care that occurs when patients are sent for diagnostic tests or moved to other ED areas during the course of physical therapy intervention. Further measures (eg, total cost of care, number of returns within 72 hours for the same complaint) are being pursued, but such data are not easily accessed due to a limited number of BJH information system staff who can analyze hospital data.

Ensuring appropriate follow-up of patients seen in the ED is challenging but important. In comparison with national data reported in 2005,<sup>1</sup> the case mix within the BJH ED has more patients funded by Medicare (27.2%) and Medicaid (27.2%), fewer supported by commercial health insurance (24.4%), and more who lack insurance completely (23%). To provide uninsured patients with follow-up physical therapy care, a Saturday pro bono clinic was established. This clinic is staffed by WUSM professional doctor of physical therapy students supervised by faculty practitioners. In the first year of the pro bono clinic, 168 patients were referred and 82 patients were seen. In the next year, 236 patients were referred and 104 patients were seen.

## Discussion

Thus far, physical therapy has been used in all areas of the BJH ED, which now hosts 88,000 visits annually. Physical therapists have evaluated and treated patients with many different medical diagnoses and have assisted with pain management, safety assessments, differential diagnosis of complex medical conditions, and discharge planning. Although the frequency of physical therapy consults continues to increase, the most chal-

**Table 5.**  
2008 Resources for Follow-up (n=231)

Follow-up	Percentage
Outpatient physical therapy	84.4
Referred back to physician	7.8
Hospital admission	4.8
Home physical therapy	1.7
Other	1.3

lenging role has been to educate other ED providers about the knowledge and skills a physical therapist contributes in managing musculoskeletal problems. Our current average of approximately 3 patients per day (compared with the expectation in faculty practice of 12 patients per day) reflects how physical therapy intervention is complicated by acuity and severity of pain, specialty consultations, medical testing and medication regimens, and transfers to other areas within the ED. To reduce the number of return visits to the ED in less than 72 hours, especially because of persistent pain, patients are provided with extensive education and appropriate follow-up resources (Tab. 5). Unfortunately follow-up in our pro bono clinic is compromised by the numerous patients who do not keep appointments, possibly because of transportation issues and family obligations.<sup>30</sup>

This project has expanded the visibility of physical therapy among providers in the BJH ED and begun to demonstrate how using physical therapy services may help improve overall patient care in the emergent care setting. Physical therapist practice in the ED requires adapting to many complexities while providing rapid and effective patient care services. Exceptional skills in identifying movement and postural faults and the ability to systematically assess their origin and meaning are essential. Equally important is the ability to identify patient problems that are not amenable to physical ther-

apy. Consistent with the literature, the preliminary data suggest high levels of patient satisfaction with the service<sup>3,12,25</sup> and decreased waiting time.<sup>25</sup> Although costs have not been shown to be reduced, most ED personnel now understand how physical therapists can identify conditions appropriate for physical therapy referral. This ability could enable physical therapists to enter the triage process at an earlier stage to decrease some patients' need for radiographs and pain medication and to decrease further overall patient waiting time by expediting physical therapy consultation requests for patients with musculoskeletal complaints. These changes could allow other ED providers to focus on more urgent patient cases.<sup>29</sup> These initiatives are expected to require continual reinforcement and preliminary testing because their implementation requires modifying traditional ED processes and influencing existing ED culture.

Additional recommendations in expanding and refining physical therapy service in the ED include:

- Establishing standing orders that enable triage of patients with musculoskeletal pain directly to physical therapists while ensuring appropriate precautions to avoid clinical error.
- Building a financial model to ensure the stability of the service.
- Developing a physical therapy staffing model that optimizes ED coverage while permitting practitioners to pursue other professional obligations.
- Improving service assessment by comparing outcomes of care (eg, cost of care, pain, length of stay, function) for patients reporting specific musculoskeletal complaints who do and do not receive physical therapy.

This practice venue has enabled physical therapists to use their knowledge, diagnostic skills, and ability to manage pain and musculo-

skeletal injury as they are seen in the hospital ED. The partnership with a teaching hospital may have had some initial benefits in welcoming new consultative services. However, building the service required multiple levels of approval and visibility that may not be needed in less complex hospitals. Independent of the environment, this practice has required creativity, flexibility, persistence, and an appreciation for other practitioners' resistance to changing the traditional patterns of triage and care within EDs. The future intention is to incorporate clinical education opportunities during physical therapists' professional training, residencies, and fellowships to reinforce this practice direction as a viable career option for physical therapists in this country. The opportunity to bridge organizational lines has enhanced the professional development of those involved and cemented relationships across disciplines.

Dr Deusinger and Dr Deusinger provided concept/idea/project design, data analysis, project management, fund procurement, institutional liaisons, and consultation (including review of manuscript before submission). All authors provided writing. Ms Czuppon provided data collection and patients.

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