

Original Research

Delay in Time to Physical Therapy After Orthopaedic Treatment

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Abstract

Background: Pediatric patients are often prescribed physical therapy following an orthopaedic diagnosis or surgical procedure; however, many children experience delays, which can consequently prolong recovery. The purpose of this study was to identify the factors that delay the patient's ability to receive timely care after referral to physical therapy (PT).

Methods: Pediatric patients who were ordered physical therapy after orthopaedic treatment were prospectively recruited to participate in this study. Patients were administered a demographic questionnaire upon enrollment. Data collected included initial referral, date of authorization, and date of first PT appointment. A delay was defined as a wait of 2 weeks or more between the referral and first physical therapy appointment.

Results: Of 100 orthopaedic patients enrolled, 60% (60/100) had government insurance and 40% (40/100) had private insurance. Significant differences were revealed between insurance type ($p=0.005$), ethnicity ($p=0.005$), and site of injury ($p=0.02$) in time to first appointment. Patients with government insurance were 3.4 times more likely than patients with private insurance to experience a delay to physical therapy (95% CI: 1.5, 8.2). Only 27% (11/40) of patients with private insurance experienced a delay as compared to 57% (34/60) of patients with government insurance. Ten percent (6/60) of the patients with public insurance were never able to see a physical therapist while all privately insured patients were ultimately seen in PT. In multivariable analysis, Hispanic ethnicity and hip conditions were associated with delay in receiving PT.

Conclusion: Patients with government insurance were over three times more likely to experience a delay in attending a physical therapy appointment than patients with private insurance, and 10% of patients with public insurance never saw a physical therapist. Insurance type may directly influence access to care or may be associated with demographic and socioeconomic factors decreasing the ability to utilize care.

Level of Evidence: III

Key Concepts

- There is a delay in time to PT based on insurance type, ethnicity, and site of injury.
- Patients with government insurance were over three times more likely to experience a delay in their initial physical therapy appointment than patients with private insurance.

Introduction

In 2009, the Patient Protection and Affordable Care Act (PPACA) was implemented, expanding Medicaid eligibility to those with incomes up to 138% of the poverty level. By 2016, about 20 million people had obtained insurance through the Medicaid insurance marketplace.¹ With this expansion, government officials aspired to improve healthcare access and treatment outcomes for those previously uninsured.² Although the expansion did provide insurance coverage for millions who were formerly uninsured, the literature has demonstrated a trend of inferior outcomes when comparing Medicaid to private insurance.²⁻⁵ Moreover, Medicaid patients often experience added frustrations in finding clinics that accept their insurance. Rogers et al.¹ found that only 52% of clinics in a large metropolitan area accepted Medicaid insurance and this number did not differ significantly in cities where the majority of the residents rely on Medicaid. Furthermore, of the clinics that did not accept Medicaid, only 29% were able to refer the patient to a clinic that would accept it. This may potentially prolong patients' ability to start physical therapy (PT) because it places the burden of finding a compatible clinic on the patient or caretaker. Consequently, it is common for Medicaid beneficiaries to return for their follow-up or postoperative appointments without the completion of any of their prescribed PT.¹ Physical therapy is an essential component of rehabilitation for a variety of conditions, especially when it comes to orthopaedic treatment. Unfortunately, a patient's insurance type may play a crucial role in the timing of care and the outcomes experienced.

In addition to insurance status, race and ethnicity also may have a significant impact in the utilization of and access to physical therapy. Of the 10 million Americans who attend outpatient physical therapy or occupational therapy each year, the majority can be described as white, insured, educated and maintain higher levels of income.⁶ In a systematic review of social determinants of health, Braaten et al.⁷ had concluded that non-Hispanic whites were more likely to seek out and access physical therapy than black or Hispanic patients. While race and/or ethnicity may not directly cause these issues, they may reflect socioeconomic factors such as the inability to take time off from work, lower household income, and lack of access to transportation. Reasons for these disparities are multifactorial and are not entirely isolated to one specific or fundamental cause. Some speculated contributors include the existence of systemic inequality, lack of readily accessible resources in areas of low socioeconomic status and an absence of representation among physicians and specialists.⁷⁻⁹

Previous studies have investigated the discrepancies in access to care between insurance types; however, no studies have prospectively examined how insurance type and other socioeconomic factors influence delays and clinical outcomes following referral to physical therapy. Our institution sought to investigate potential disparities in care experienced by pediatric patients with public insurance compared to those with private insurance after referral for physical therapy following orthopaedic treatment.

Materials and Methods

Institutional Review Board approval was obtained for this study. Recruitment occurred between January 2017 and July 2020. Pediatric patients between the ages of 2-18 years who were referred to physical therapy after orthopaedic treatment were prospectively recruited from an orthopaedic clinic of a major metropolitan institution. At this institution, the physical therapy department is separate from the orthopaedic clinic and cannot accommodate all outpatients referred for PT services, necessitating referral to outside centers. Patients were excluded if their orthopaedic follow-up was less than 12 weeks, if they were over the age of 18, or if they were diagnosed with a congenital complex hand or brachial plexus condition and were referred to occupational therapy. Patients were also excluded if their caregiver was under the age of 18 or cognitively unable to fill out the surveys.

Each subject was administered a demographic questionnaire upon recruitment. Research Electronic Data Capture (REDCap) was used to electronically distribute the surveys to patients or their parents, depending on the patient's age and cognitive ability. The Child Opportunity Index (COI) was calculated from zip codes as a measure of socioeconomic status.¹⁰ Patient follow-up was collected for purposes of tracking complications for a minimum of 12 weeks. Date of referral, authorization (if required), and first appointment with therapy were collected. If referral occurred prior to surgery, the date of surgery was used as the date of referral for analysis purposes. A delay was defined as a wait of 2 weeks or more between the referral and first physical therapy appointment.

Complications were also assessed as part of data collection. Complications were defined as problems that occurred during treatment which resulted in delayed recovery. Electronic medical records were used to collect data regarding complications for 90 days following orthopaedic treatment.

The data were analyzed using STATA/IC 14.0 (Stata Statistical Software: Release 14; StataCorp LP, 2015,

College Station, TX). Fisher's exact test was used to examine the relationship between delay in PT and categorical variables. Two-sample t-tests were used to examine the relationship between delay in PT and continuous variables. Statistical significance was defined as $p < 0.05$. Significant predictors from the univariate analysis were included in a multivariable logistic regression.

Results

Overall, 125 patients with an orthopaedic etiology met inclusion criteria and were enrolled in the study. Twenty-five patients were enrolled but were excluded due to loss of follow up. Forty-five percent (45/100) of patients were male and 55% (55/100) were female. Participants had a mean and standard deviation (SD) age of 12.9 ± 3.4 years (range 2-18). Patients were referred to PT for the following areas of concern: knee (44%), hip (12%), arm (9%), foot (8%), back (3%), leg (21%), and shoulder (3%). The majority of patients (83%) received PT following surgical intervention, while the remaining were nonoperative. The rate of surgical treatment did not differ significantly based on the body region affected (lower extremity 88%, back and upper extremity 73%, hip 67%; $p = 0.10$).

Eighteen percent (18/100) of patients were white, 57% (57/100) Hispanic, and 25% (25/100) other race/ethnicity. The majority of patients and their families spoke English as their primary language (78%). A third (21/57, 37%) of Hispanic patients spoke Spanish as their primary language. All of the included patients were insured: 60% (60/100) of patients had government insurance and 40% (40/100) had private insurance. Hispanic (79%) and other non-white patients (44%) were more likely to have government insurance than white patients (22%) ($p \leq 0.002$). The rate of government insurance did not differ significantly based on body region (lower extremity 53%, back and upper extremity 73%, hip 83%; $p = 0.09$) or surgery (operative 59%, non-operative 65%; $p = 0.79$). COI was significantly lower for Hispanics ($p < 0.001$) and patients with government insurance ($p < 0.001$).

Overall, 55% (55/100) of patients received PT within 2 weeks of referral, and 39% (39/100) experienced a delayed PT of more than 2 weeks after referral. The average delay was 5.4 weeks. Six patients (6%) never received physical therapy. All of these patients had public insurance and 5/6 (83%) were female. Four were Hispanic, and two identified as other ethnicity.

In univariate analysis, there were significant relationships of insurance type ($p=0.005$), Hispanic ethnicity ($p=0.01$), and site of complaint ($p=0.02$) to experiencing a delay from referral to first PT appointment (Table 1). Sex,

age, COI, and whether the patient had surgery did not affect the timeliness of receiving PT ($p>0.17$) while the effect of language was close to significance ($p=0.06$). Delays in receiving PT were most common for Hispanic patients and those with hip conditions. Most notably, Hispanic patients were the only ethnicity documented that had higher numbers of patients who experienced a delay (33/57, 58%) than did not (24/57, 42%). Patients with government insurance were 3.4 times more likely than patients with private insurance to experience a delay to physical therapy (95% CI: 1.5, 8.2). Fifty-seven percent (34/60) of patients with government insurance

Table 1. Patient Characteristics

	No Delay (≤ 2 weeks to PT) N=55	Delay (> 2 weeks to PT or no PT) N=45	P
Sex			0.69
Male	26/45 (58%)	19/45 (42%)	
Female	29/55 (53%)	26/55 (47%)	
Age (yr)	13.3 (3.3)	12.3 (3.6)	0.18
Ethnicity			0.005
White/Other	31/43 (72%)	12/43 (28%)	
Hispanic	24/57 (42%)	33/57 (58%)	
Site of injury			0.02
Lower extremity	43/73 (59%)	30/73 (41%)	
Back/Upper extremity	10/15 (67%)	5/15 (33%)	
Hip	2/12 (17%)	10/12 (83%)	
Insurance			0.005
Public	26/60 (43%)	34/60 (57%)	
Private	29/40 (73%)	11/40 (28%)	
Language			0.06
English	47/78 (60%)	31/78 (40%)	
Spanish	8/22 (36%)	14/22 (64%)	
Child Opportunity Index	42.7 (27.8)	36.3 (23.8)	0.22
Surgery			0.29
Non-surgical	7/17 (41%)	10/17 (59%)	
Surgical	48/83 (58%)	35/83 (42%)	

Categorical variables are presented as n (% with delay or no delay) and compared using Fisher's exact test. Continuous variables are presented as mean (SD) and compared using t-tests.

experienced a delay to physical therapy, as opposed to 27% (11/40) of patients with private insurance. Patients with government insurance experienced a mean (\pm SD) time to PT of 3.7 ± 4.5 weeks (95% CI: 2.5, 5.0) while those with private insurance coverage averaged a time of 1.7 ± 1.5 weeks (95% CI: 1.2, 2.2) ($p=0.007$). Of the patients with public insurance, 13% (8/60) experienced a delay of 8 or more weeks before their first PT appointment and 10% (6/60) were never able to see a physical therapist. In comparison, only 8% (3/40) of patients with private insurance experienced a delay of 5 weeks or more for their first PT appointment, and all privately insured patients were ultimately seen by a physical therapist.

Based on the results of the univariate analysis, multivariable analysis was performed including insurance type, ethnicity, and site of complaint as potential predictors of not receiving PT within 2 weeks. Hispanic ethnicity compared with whites ($p=0.03$) and hip conditions compared with upper and lower extremity ($p\leq 0.04$) remained significant factors, but insurance type ($p=0.14$) was no longer significant.

Although not found to be statistically significant, it is worth noting that 8% (5/60) of patients with public insurance and no patients with private insurance experienced complications during the course of treatment ($p=0.08$), and 80% (4/5) of these patients identified as Hispanic. Complications experienced by those who were publicly insured included misdiagnosis of stress fracture as sprain, leading to repeated castings and persistent pain; modified Dunn procedure hardware failure, requiring revision surgery; meniscal tear revision due to meniscal volume deficiency; arthrofibrosis after patellofemoral ligament reconstruction requiring revision surgery; and femur fracture sustained during PT after femur arthrogram, leading to discontinuation of PT. Four out of five of these complications led to additional surgery.

Discussion

In this study, publicly insured patients were over three times more likely than privately insured patients to

experience significant delays in initiating physical therapy, which is comparable to results found in previous literature.^{2,3,5,11} The intention of PPACA Medicaid expansion was to improve health outcomes for those who could not obtain insurance in the private market; however, despite the increase in eligibility, studies have shown that those with Medicaid coverage are often presented with obstacles when seeking care.^{2,3,11} Even before PPACA Medicaid expansion, pediatric patients with Medicaid coverage seeking outpatient orthopaedic care were 57 times less likely to attain a timely appointment with an orthopaedic specialist within 2 weeks as compared to a patient with private insurance.^{2,12} Unfortunately, it has not been shown that the expansion of Medicaid has improved these numbers, especially when it comes to orthopaedic care in a densely populated area.² These numbers reflect the initial difficulties patients and their families encounter in the process of attaining treatment from an orthopaedic specialist. Similar challenges may affect the ability to receive timely care once patients are referred for PT.

A few factors have been cited as the fundamental causes contributing to healthcare inequity between public and private coverage. The first crucial element is the number of clinics that accept public insurance. The Public Policy Institute of California estimated in January 2018 that more than a third of California residents are reliant on Medicaid insurance. In large counties, this number ranges from 20-50% of the population. However, despite large proportions of families that are dependent on public insurance for healthcare access, it has been found that only about half of PT clinics accept Medicaid coverage.¹ Our study shows how difficult it can be for publicly insured patients to access their first PT appointment. For all patients, 14% (14/100) of participants were delayed for more than 8 weeks or never able to see a physical therapist altogether. All 14 of these patients had public insurance.

Another vital factor affecting access to care is the reimbursement rate discrepancy between public and private insurance. One survey conducted by the Medical

Group Management Association found that more than two-thirds of medical practices reported that government insurance programs such as Medicare payments will not cover the cost of providing the care to the beneficiaries; unfortunately, Medicaid has been shown to pay only 72% of the Medicare rates and even less compared with private insurance. Moreover, Medicaid providers are not able to seek additional compensation from patients. This makes it difficult for many clinics to accept these insurance types.¹³ Provisions to the Social Security Act aimed to counter these differences by requiring that physician reimbursement rates be sufficient to attract more acceptance from clinics; however, the contrast in reimbursement rates remains substantial.² One study found that Medicaid was accepted at only 48.2% of physical therapy clinics within a large metropolitan area, whereas private insurance was accepted at almost all clinics.¹ Of these clinics, 39.4% claimed they could not take Medicaid due to “no contract” and 13.6% cited “low reimbursement rates.” Even in cities where Medicaid coverage is particularly high among residents, Medicaid acceptance amid PT clinics remains at about 50%.¹ This reflects reduced access to PT for publicly insured patients.

While there are clearly barriers in access to care associated with public insurance, our results found a strong relationship between insurance type, ethnicity, and socioeconomic status. Patients with public insurance were more likely to be Hispanic and have lower COI scores. Therefore, greater delays in receiving care for patients with public insurance may be due, at least in part, to other factors related to socioeconomic status. In fact, the multivariable analysis found that insurance type was not a significant predictor of delays once Hispanic ethnicity was taken into account. Hispanic patients had significantly lower socioeconomic status as measured by the COI, which may contribute to a decreased ability to access or utilize care. Language barriers, less access to transportation, greater difficulties taking time off work to attend appointments, decreased social support, lower health literacy, and less comfort navigating the medical system may all play a role in access and utilization.

In our area, those who are publicly insured often have to wait for a referral to consult an orthopaedic surgeon, which results in longer waiting periods for diagnosis and treatment. Hung et al. found that these delays from time of injury to consultation caused publicly insured pediatric patients to experience poorer surgical outcomes with higher rates of reoperation.¹¹ Our study did not show significant contrast between groups in terms of outcomes; however, those who were publicly insured did have a greater percentage of patients who required reoperation.

Medicaid patients and those with lower socioeconomic status often have to travel further distances to be seen by an orthopaedist causing delays in being seen and receiving a diagnosis.² The inequality of care becomes increasingly apparent as additional services are needed such as surgery, physical therapy, X-rays, and magnetic resonance imaging (MRI). Hung et al.¹¹ found a significant difference in time of injury to MRI as well as time of injury to surgery for pediatric patients with private insurance when compared to those with Medicaid. Privately insured patients were seen by their doctor almost five times faster than those with public insurance and received MRIs more than four times sooner. These factors make it twice as likely for Medicaid patients to develop secondary injuries. Our study provides additional evidence supporting these findings. Although not statistically significant, complication rates were four times greater in those with public insurance compared to those with private insurance. The increased rates of complications can be due to a multitude of factors previously mentioned, including a delay to first orthopaedic appointment, delays in diagnostic services (i.e., X-ray or MRI), delay to surgical appointment, poor attendance, and/or delay to physical therapy. Each of these services are crucial steps in orthopaedic care and optimal healing.¹⁴ Because of this, it is imperative that patients are able to access PT in a timely manner to avoid complications and added healthcare costs.

A patient’s ethnicity may have a direct or indirect effect on overall outcomes as well as timing and access to

physical therapy. Especially within the United States, ethnicity seems to contribute to the odds of timely access to rehabilitative services.^{8,15,16} Although a paucity of literature exists on the subject, a systematic review on the association of race and physical therapy concluded that both Black and Hispanic patients were more likely to experience delays or forgo physical therapy services altogether.⁷ The results of our study echo these findings, especially among patients identifying as Hispanic.

Patients who were Hispanic had the highest percentages among all groups when it came to experiencing a delay to their first PT appointment. In our study, 58% of Hispanics experienced a delay as compared to only 17% of Whites. Of the patients that never received physical therapy, 4/6 (66.7%) identified as Hispanic. Likewise, Hispanics also made up the majority (4/5, 80%) of patients who experienced complications. Reasons for the delays and complications are multifaceted and require a more detailed insight into each individual case. However, this data demonstrates the need for greater support among ethnic minority groups in order to improve outcomes, attendance, and access to care.

Lastly, the results of this study show that delays to PT are more likely to be encountered when seeking rehabilitative services after orthopaedic treatment of hip conditions, including dislocation, slipped capital femoral epiphysis, acetabular dysplasia, or persistent hip/groin pain. Ten out of 12 patients in our study who were referred to PT for hip rehabilitation experienced a delay of 3 weeks or more, with 3/12 (25%) waiting more than 8 weeks to their first PT appointment and 2/12 (16.7%) were never able to see a physical therapist at all. One possibility for these delays may be PT discomfort with complex diagnoses. Physical therapists may not feel comfortable treating certain hip conditions, causing these patients to wait longer for a therapist who is knowledgeable and comfortable with the protocols needed. These concerns may be warranted as 2/12 (16.7%) patients who were seen for hip conditions and referred to PT experienced complications, which required return to the operating room. One patient was seen for a dislocated hip related to cerebral palsy and the other

for slipped capital femoral epiphysis. Hip surgeries were associated with the highest rates of complications among all locations.

The results of our study demonstrate the influence of insurance type, ethnicity, socioeconomic status, and site of pathology when it comes to timeliness to care and overall outcomes. It is essential to bring awareness to these discrepancies, so providers are able to take action and be of better support to their patients. Possible solutions to these issues may include immediate referrals to a specialty clinic when needed and increased Medicaid reimbursement rates to attract greater acceptance among clinics. Implementation of these changes can potentially improve outcomes for publicly insured individuals and prevent families from having to travel long distances or take more time off work for caregiving.

A strength of our study is its prospective nature. This is, to our knowledge, one of the only studies to prospectively follow patients from their physical therapy referral to follow-up in an orthopaedic clinic. This allowed for the collection of data regarding complications. Moreover, our study adds evidence to the current literature of the discrepancies in care based on insurance, ethnicity, socioeconomic status, and other factors.

This study is limited by the use of a single institution in a large metropolitan area within a populous state. Additionally, it has been shown in previous studies that academic practices are more likely to accept Medicaid insurance than private practices.² This may have been an advantage to local residents near our academic institution but a disadvantage to those who had to drive long distances to seek orthopaedic care and physical therapy. This study did not collect transportation data from families which could provide us with a greater sense of specific causes for delays and whether they were due to lack of access to PT, lack of utilization, or other potential causes of delayed PT.

Conclusion

Patients with government insurance, Hispanic ethnicity, and orthopaedic conditions affecting the hip were most

likely to experience a delay to their initial physical therapy appointment. Insurance status and ethnicity may intersect with language and socioeconomic status in contributing to the discrepancy in obtaining PT services. This study provides further evidence that a patient's ability to access and utilize their prescribed PT services depends on a multitude of factors, which may include insurance status.

Additional Links

- National Library of Medicine: [Insurance Status Affects Access to Physical Therapy Following Rotator Cuff Repair Surgery: A Comparison of Privately Insured and Medicaid Patients](#)
- *The American Journal of Surgery*: [Follow-up Disparities After Trauma: A Real Problem for Outcomes Research](#)

Disclaimer

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