

# The Prevalence of Abnormal Vital Signs in Outpatient Physical Therapy: A Pilot Study of One Hospital System

Nathan Andrews, SPT and Raven Cochran, SPT  
Ellen Donald, PhD, PT and Kathleen Swanick, DPT, MS, OCS  
Florida Gulf Coast University, Department of Rehabilitation Sciences, Fort Myers, FL, USA

## Introduction

- Vital signs including heart rate (HR), blood pressure (BP), and oxygen saturation (SpO<sub>2</sub>) are powerful tools for the general assessment of a patient's overall cardiopulmonary (CP) function.
- Applications to physical therapy practice include determining if a patient's health is appropriate for physical activity or if the patient's condition warrants treatment modification, including referral to another healthcare professional.<sup>1</sup>
- The American Physical Therapy Association (APTA) states that vital signs measurement should be measured during every visit by a new patient or client.<sup>2</sup>
- Previous research suggests many patients in outpatient physical therapy have CP comorbidities.<sup>1, 7-11</sup>
- Current literature indicates regular assessment of vital sign is not common practice in the profession of physical therapy.<sup>3-7</sup>

## Purpose/Research Questions

- The purpose of this study was to determine the prevalence of abnormal vital signs in physical therapy outpatients and physical therapist action following assessment of vitals. Research questions:
- What is the prevalence of abnormal resting HR, BP, and SpO<sub>2</sub> values in the outpatient physical therapy population?
- What is the percentage of patients that have abnormal resting vital signs, where a CP diagnosis was previously not documented in medical record?
- What actions are taken by physical therapists following routine vital signs assessment when abnormal readings are found?

## Methods

- The prevalence of abnormal resting vital signs in the outpatient physical therapy population was examined within a large health care system in Fort Myers, Florida.
- Patient data of encounters from 6 physical therapists were retrospectively reviewed in patient medical records.
- Vital sign data from patient encounters spanning a 5-month period (April 1, 2018 to September 1, 2018) was obtained from documentation of initial physical therapy evaluation and subsequent treatment visits for each patient.
- De-identified demographic data collected consisted of age, sex, categorized reasons for physical therapy evaluation and treatment, diagnosis of CP disease, and documented action of the physical therapist and was stored on a protected spreadsheet.

## Results

### Sample Characteristics

- A total of 317 patients were included in the sample with a total of 2119 encounters across all patients.
- 1556 of the total encounters occurred with vital signs assessment to be included in the analysis.
- The age of patients ranged from 18-99 years (average age of 67 years), over half of which were female (58%).
- Most patients (76.7%) had a previous CP diagnosis documented.
- There were 23.3% of patients without a previous CP diagnosis. These patients were younger on average than the total sample (average age of 56 years).
- The most common reason for physical therapy evaluation and treatment was musculoskeletal or peripheral nerve dysfunction followed by vestibular or balance, neurological, and other.

### Vital Signs

- The frequency of measurement for BP for all patients across all encounters is summarized in Table 1.
- A normal HR was present 85.8% of encounters with a bradycardic and tachycardic HR range for 11.7% and 2.9% of encounters, respectively.
- Normal SpO<sub>2</sub> values were common (97% of encounters) while a low SpO<sub>2</sub> was rare (1.6% of encounters).

**Table 1. Frequency of Normal and Abnormal BP Across all Patients**

BP Range	Frequency	(%) Mean percentage of encounters
Normal	362	24.6
Elevated	362	22.8
Stage I Hypertension	390	24.1
Stage II Hypertension	425	27.9
Hypertensive Crisis	2	.08

- BP for patients without CP diagnosis is summarized in Table 2.
- Normal HR was present on 92% of encounters with those without a CP diagnosis while a HR in the bradycardic and tachycardic range was present on 5.9% and 3.6% of encounters respectively.
- Normal SpO<sub>2</sub> levels were common (96.4% of encounters) while a low SpO<sub>2</sub> was rare (2.9% of encounters).

**Table 2. Frequency of Normal and Abnormal BP Across Patients without Previous CP Diagnosis**

BP Range	Frequency	(%) Mean percentage of encounters
Normal	101	35.8
Elevated	75	26.7
Stage I Hypertension	79	21.5
Stage II Hypertension	49	14.1
Hypertensive Crisis	0	0

### Frequency of Physical Therapist Action

- Frequency of a physical therapist taking an action as a result of abnormal findings is summarized in Table 3.
- There was no documented action following vital sign assessment during 94.5% of encounters
- During encounters with one or more abnormal vital signs, no action was documented 94.4% of the time.

**Table 3. Frequency of Physical Therapist Action**

Action	(%) Encounters with one or more Vital Sign Assessed	Frequency (%) Encounters with Vital Signs Assessed	Frequency (%) Encounters with All Normal Vital Signs	Frequency (%) Encounters with Any Vital Sign(s) Abnormal
1	94.5	1471 (94.5%)	315 (94.9%)	1157 (94.4%)
2	0.2	3 (0.2%)	-	3 (0.2%)
3	4.2	65 (4.2%)	15 (4.5%)	50 (4.1%)
4	0.2	3 (0.2%)	1 (0.3%)	2 (0.2%)
5	0.4	7 (0.4%)	1 (0.3%)	6 (0.5%)
6	0.3	5 (0.3%)	-	5 (0.4%)
7	0.1	2 (0.1%)	-	2 (0.2%)
Total	100	1556	332	1225

1=no action 2=vital signs re-assessed 3=vital signs continually monitored 4=treatment modified 5=treatment modified and patient referred to medical specialist 6=treatment deferred and patient referred to medical specialist 7=patient transported to emergency room

## Data Analysis

- Descriptive statistics included mean, standard deviation, and range and were generated for each of the following variables: age, sex, reason for physical therapy evaluation and treatment, presence of previous CP diagnosis, frequency of vital sign assessment (HR, BP, and SpO<sub>2</sub>), frequency of normal and abnormal BP, HR and SpO<sub>2</sub>, and physical therapists' actions.

## Discussion

- Most patients (76.7%) had a previous CP diagnosis documented in medical records, a percentage higher than estimates of cardiovascular disease in the general adult population.<sup>12</sup> This support claims by previous research suggesting outpatient physical therapists have a high likelihood of evaluating and treating patients with pre-existing cardiovascular or pulmonary comorbidities.
- Encounters with an abnormal resting BP occurred during the majority of patient encounters on average. This finding supports previous research claims that a large proportion of adults in the general population meet clinical criteria for hypertension but may lack a formal diagnosis in their medical record or may not be receiving adequate treatment to control their BP.<sup>13,14</sup>
- Physical therapists rarely document action in response to vital sign values. No action was documented during most patient encounters (94.5%), even if resting vitals were in an abnormal range (94.4%). Although physical therapists took a variety of actions when abnormal vital signs were present, these actions were taken infrequently relative to the high rate of abnormal vital sign values that were found.

## Conclusions

- The high prevalence of abnormal vital signs in the outpatient physical therapy population warrants frequent vital sign assessment, regardless of the presence of previously documented CP disease.
- This pilot study provides evidence that vital signs assessment by a physical therapist can detect potentially dangerous health conditions which should result in appropriate referral for treatment, provided action is taken.
- There appears to be a need for further education on the prevalence of abnormal vital signs and the need for appropriate action on the part of the physical therapist.