Documentation of Red Flags by Physical Therapists for Patients with Low Back Pain

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Abstract: The comprehensiveness of physical therapists' adherence to the guidelines for red flag documentation for patients with low back pain has not previously been described. Therefore, the purpose of this study was to describe that comprehensiveness. Red flags are warning signs that suggest that physician referral may be warranted. Clinic charts for 160 patients with low back pain seen at 6 outpatient physical therapy clinics were retrospectively reviewed, noting the presence or absence of 11 red flag items. Seven of the 11 red flag items were documented over 98% of the time. Most charts (96.3%) had at least 64% of the red flag items documented. Documentation of red flags was comprehensive in some areas but lacking in others. Red flags that were regularly documented included age over 50, bladder dysfunction, history of cancer, immune suppression, night pain, history of trauma, saddle anesthesia, and lower extremity neurological deficit. The red flags not regularly documented included weight loss, recent infection, and fever/chills. Factors influencing item documentation comprehensiveness are discussed, and suggestions are provided to enhance the completeness of recording patient examination data. The study results provide a red flag documentation benchmark for clinicians working with patients with low back pain and they lay the groundwork for future research.

Key Words: Medical Screening, Clinical Guidelines, Differential Diagnosis, Physical Therapy, Low Back Pain

The Guide to Physical Therapist Practice[1] states that " . . . the initial patient examination is a comprehensive screening and specific testing process leading to diagnostic classification or, as appropriate, to a referral to another practitioner . . . " Medical screening, associated with the examination and evaluation processes leading to patient referral by physical therapists to practitioners such as physicians (e.g., medical and osteopathic doctors), is of particular importance when treating patients with complaints of low back pain (LBP) where serious medical disease may present as a musculoskeletal complaint[1-4]. Several medical conditions, such as cancer, infections, and fractures, have been shown to cause LBP thereby mimicking a mechanical LBP condition[3-9]. Additionally, mechanical LBP may co-exist with a serious medical condition that warrants physician involvement[10-12]. Considering that patients with LBP constitute the largest outpatient population serviced by physical therapists[11,13-15], vigilance for red flag examination findings (i.e., patient manifestations that suggest that physician referral may be warranted) associated with these serious disorders by therapists is imperative. The medical screening goal for patients with LBP is to identify those with high probabilities of having serious medical conditions causing their back pain, or those patients who have an unrelated health problem co-existing with LBP[1,2,16,17].

Experts have provided varied opinions as to what constitutes a red flag finding for patients with LBP. For example, several sources have indicated that duration of symptoms over 1 month is a red flag [6,9,18,19] while others have reported duration of over 1.5 to 3 months as a red flag[20-24]. Some

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sources have included a history of trauma as a red flag item[22,25], while other sources have omitted this item from the red flag list[18,19]. In addition, very few symptoms by themselves are indicative of a serious medical condition. Night pain has long been listed as a red flag finding for patients with LBP[6,24-26], yet studies have reported an association of night pain with osteoarthritis especially when the lumbar, hip, and knee regions are involved[20,23,27,28]. Probably more clinically relevant is an examination that reveals a pattern or cluster of red flag findings that raises the clinician's suspicion of serious medical conditions[5,10,16,24,26]. For example, Deyo and Diehl[18] reported that patient age over 50 years, history of cancer, unexplained weight loss, duration of pain greater than one month, or failure to improve with conservative therapy was associated with increased probability of cancer being present in patients with LBP. If present, these findings should lead to a further diagnostic work-up[9,18]. To promote consensus, Bigos et al[25] delineated a list of red flag findings associated with potential fracture, tumor, infection, and/or cauda equina syndrome for patients with acute LBP that was presented in the U.S. Department of Health and Human Services Agency for Health Care Policy and Research (AHCPR) *Clinical Practice Acute Low Back Pain Guideline* (Table 1). Their recommendation was that all practitioners involved in the management of this population should routinely investigate these red flags.

To what degree does this level of red flag screening for patients with LBP occur in clinical practice? In physician practices, the results are mixed. For example, in a study by DiIorio[19] that investigated documentation of specific red flags, physicians routinely asked about 2 (saddle anesthesia and history of trauma) of 7 red flag items over 50% of the time. They did not routinely inquire about 1) pain at rest, 2) pseudo-claudication, 3) age over 50 years, 4) recent infection, and 5) pain duration over one month. Similarly, Ramsey et al[29] documented deficiencies in the history-taking skills of primary care physicians. Using audiotapes of the primary care physicians' evaluations of standardized patients with a wide variety of complaints, the frequency of asking questions (symptom description, medications, and review of systems) designed to detect underlying medical conditions related to the primary patient complaint was monitored. The results revealed that in total 59% of these essential history items were collected by the physicians, while the mean percentage of history items that the physicians obtained related to symptom description was 75%, medications 77%, and review of systems 44%.

Patient case reports and case series have been published that describe physical therapists referring patients with LBP to physicians with a subsequent diagnosis of infections, fractures, and vascular claudication[10,12,17,,28,30,31,32,35], but we did not find literature describing to what degree physical therapists documented red flag findings during patient examinations. This topic is relevant considering that patients have direct access to physical therapy services for examination and treatment in 43 states in the US. The primary purpose of this study was to describe the comprehensiveness of red flag documentation during the initial patient visit by physical therapists providing care for patients with LBP. Also, because it could be argued that physical therapists might screen patients more or less thoroughly based on several factors, a secondary purpose of the study was to explore whether the comprehensiveness of red flag documentation differed for patients who (1) had general, non-specific back pain versus specific diagnoses, (2) were referred by generalist versus specialist physicians, (3) had or did not have completed diagnostic testing, and (4) were under the age of 50 years versus those aged 50 years and over.

METHODS

Therapists

Six physical therapy private practice clinics in the Tacoma, Washington metropolitan area participated in the study, and 16 physical therapists examined the 160 patients whose records were reviewed for the study. Therapist work experience ranged from 1 to 30 years, with a mean of 11.7 years (SD ±9.9 years). Three of the physical therapists (18.8%) were certified by the *American Board of Physical Therapy Specialties* as orthopedic-certified specialists. Six of the therapists (37.5%) reported having taken a post-graduate medical screening course.

Patients

All 6 participating clinics share a medical records system, so a master list of patients with ICD-9 codes (*International Classification of Diseases, Ninth Revision*) related to LBP or any related lumbar dysfunction was generated, from which 160 patient charts with an ICD-9 code (per the physician referral) related to the lumbar/sacral spine were sampled consecutively. The patients included 69 men (43%) and 91 women (57%) aged 15 to 81 years with a mean of 47.6 years (SD ±15.5 years). Almost 50% of the patients were referred to physical therapy with a non-specific diagnosis of LBP (e.g., low back pain), just over 50% of the patients were referred by a family practitioner, and 12% had not had any diagnostic tests completed. See Table 2 for a complete summary of patient diagnostic and referral information.

Procedure

A data collection sheet was developed to record the therapist documentation of patient demographic information and red flag findings from examination as described in the AHCPR practice guideline for patients with acute LBP (Table 1) [25]. The primary author reviewed the 160 patient charts noting

TABLE 1. Red flags item description and rationale

Red Flag Item	Description	Rationale	References
Trauma	History of minor or major trauma, motor vehicle accident, fall, strenuous lifting	Possible fracture, especially in an older or osteoporotic patient	25
Age	50 years or more	Increased risk of cancer, abdominal aortic aneurysm, fracture, infection	3,5,18,19,21,25
History of cancer	Past or present history of any type of cancer	History of cancer increases the risk of cancer-causing low back pain. Back pain may be caused by metastic tumors arising from the kidney, thyroid, prostate, breast, lung	5,18,21,24,25
Fever, chills, night sweats	Fever over 100 degrees Fahrenheit, a sensation of being cold, waking up sweating, temperature changes at night	Constitutional symptoms may increase the risk of infection or cancer	3,18,21,25
Weight loss	Unexplained weight loss of over 10 pounds in 3 months, not directly related to a change in activity or diet	May be indicative of infection or cancer	3,6,18,19,21
Recent infection	Recent bacterial infection such as a urinary tract infection	Increases the risk of infection	25
Immunosuppression	Immunosuppresssion resulting from a transplant, intravenous drug abuse, or prolonged steroid use	Increases the risk of infection	25
Rest/night pain	Pain that is not relieved with rest or awakens a patient at night, unrelated to movement or positioning	Increases the risk of cancer, infection, or an abdominal aortic aneurysm	5,6,19,21,24-26,29
Saddle anesthesia	Absence of sensation in the second-fifth sacral nerve roots, the perianal region	Cauda equina syndrome	13,25
Bladder dysfunction	Urinary retention, changes in frequency of urination, incontinence, dysuria, hematuria	May indicate cauda equina syndrome or infection	1,2,18,21,25
Lower extremity neurological deficit	Progressive or severe neurological deficit in the lower extremity	May indicate cauda equina syndrome	25

physical therapist documentation of patient information on the initial visit as recorded during the oral interviews as well as from the standard patient self-administered history questionnaires. For each red flag item, it was determined whether the item was documented in the therapist's note, and/or documented in the intake questionnaire, and whether the red flag information was a positive or negative response. The primary author was blinded to the identities of the patients and examining physical therapists.

Intrarater reliability for data extraction was examined at three different points during the data collection. The primary author extracted data twice for 5 charts, one week apart, before beginning the study, a process that was repeated with 5 different charts mid-study and at the study's end. At

the first and third reliability checks, percent agreement was 97.5% for individual red flag item documentation and the mid-study reliability assessment yielded 100% agreement. For all three reliability checks, there was 100% agreement as to whether the documented red flag item was recorded as a positive or negative response.

Data Analysis

Frequencies were calculated for the patient demographic information and the list of red flag examination items respectively (Tables 2 and 3). For the secondary purpose of the study, with the percentage of red flag documentation as the dependent variable, independent t-tests were calculated using 4 different factors as independent variables: 1) *diagnosis* (non-specific LBP versus other more specific diagnoses), 2) *physician background* (general practice versus specialty physician), 3) *diagnostic testing/imaging procedures* (no tests versus one or more tests administered), and 4) *subject age* (under 50 years versus 50 years and over). See Tables 2 and 3 for descriptions of these variables. Alpha was set at $P<0.05$ for each analysis. We used SPSS version 11.5 for Windows for all analyses.

RESULTS

Table 3 describes the list of red flags used for this study and to what degree the therapists documented them. Therapists in this study documented 45-73% of the 11 red flag items from the AHCPR *Acute Low Back Pain Care Guideline*[25] with a mean of 63.7% and a standard deviation of 3.0%. Eight of the 11 individual red flag items (73%) were documented over 98% of the time. The overall comprehensiveness of red flag documentation across items for each patient chart was at least 64% of the red flags documented in 154 charts (96.3%). All 160 charts had at least 45% of the red flag items documented.

As summarized in Table 4, of the red flag items that were documented, the most common positive responses included

TABLE 2. Patient diagnosis and referral information

Diagnosis	**Frequency (N=160)**	**Percent (%)**
Low back pain	76	47.5
Lumbar strain/sprain	34	21.3
Post-operative status (laminectomy, discectomy, spinal fusion)	18	11.3
Herniated nucleus pulposus	13	8.1
Degenerative joint disease	11	6.9
Other	8	5.0
Total	160	100.0
Referral Source	**Frequency (N=160)**	**Percent (%)**
General practitioner	86	53.8
Orthopedic surgeon	51	31.9
Physiatrist	15	9.3
Other	6	3.8
Self-referred	2	1.3
Total	160	100.0
Diagnostic Tests	**Frequency (N=160)[a]**	**Percent (%)[a]**
Radiograph	96	60.0
MRI[b]	83	51.9
CT[c] scan	22	13.8
EMG[d]	9	5.6
Other	1	0.6
No diagnostic tests	12	20.6

[a]Frequencies total more than 160 and percents total more than 100 because patients could have more than one test

[b]Magnetic resonance imaging

[c]Computed tomography

[d]Electromyography

TABLE 3. Comprehensiveness of red flag documentation

	DOCUMENTED IN NOTE OR QUESTIONNAIRE		IF DOCUMENTED, LOCATION OF DOCUMENTATION	
Red Flag Item	**PERCENT (%)**	**FREQUENCY (N=160)**	**Questionnaire only (%)**	**Note (%)**
Age (50 and over)	100.0	160	0.0	100.0
Bladder dysfunction	100.0	160	86.2	13.8
Cancer history	100.0	160	14.4	85.6
Immune Suppression	100	160	8.1	91.9
Rest/Night pain	99.4	159	31.4	68.6
Trauma	98.7	158	4.4	95.6
Saddle anesthesia	98.7	158	81.0	19.0
Lower extremity neurological deficit	98.7	158	81.0	19.0
Weight loss	5.0	8	0.0	100.0
Recent infection	0.0	0	N/A	N/A
Fever/chills	0.0	0	N/A	N/A

the presence of night pain (44.6%) and age 50 years and older (41.3%). Unexplained weight loss was documented in 8 of the 160 charts. Of these 8, 6 charts recorded a positive response to this red flag item. In addition, a medical history positive for cancer was documented in 8.8% of cases (Table 4).

TABLE 4. Documentation of positive red flag findings

Red flag item N=number of times documented	If documented, the frequency of positive responses	If documented, the percentage of positive responses (%)
Weight loss (n=8)	6	75.0
Night/constant pain (n=159)	71	44.6
Age 50 and over (n=160)	66	41.3
Trauma (n=158)	30	19.0
Cancer history (n=160)	14	8.8
Bladder dysfunction (n=160)	11	5.1
Immune supression (n=160)	5	3.1
Saddle anesthesia (n=158)	0	0.0

With regard to the purpose of identifying whether physical therapists documented differently depending on diagnostic, demographic, or referral information, no differences in the comprehensiveness of red flag documentation were found (Table 5).

DISCUSSION

Although the participating therapists did not consistently meet a high level of red flag documentation across each item or across all patients, the results provide insight into the comprehensiveness of therapists' history-taking and red flag documentation. The result of 96% of the therapists' charts having at least 64% of the red flags documented provides a benchmark of overall documentation. This level of red flag documentation is comparable to or exceeds that noted in physician practices related to patients with low back pain[13,19,26,29,33]. Gonzalez et al[33] found that physicians obtained 27% of the red flag items recommended by Bigos et al[25]. Gonzalez et al did not specifically identify which red flag items were routinely included. Looking beyond the overall degree of documentation, the discrepancy of documentation between red flag items is of interest.

The participating therapists routinely documented (on greater than 98% of the charts) 8 of the 11 red flag items from Bigos et al[25], with the remaining 3 items, i.e., weight change, fever/chills, and a history of infection being rarely documented (5% or less of the charts). There are several potential reasons to explain the large gap between the fre-

TABLE 5. Red flag documentation based on patient demographics, physician referral, diagnostic testing factors

	Percent of red flag item documented			
GROUPING VARIABLE	**MEAN**	**SD**	**t**	**p**
Diagnosis				
LBP (N = 76)	68.7%	4.0	–1.405	.162
Other (N = 84)	69.5%	3.4		
Referral source				
Family practitioner (N=86)	68.9%	3.2	–.754	.452
All others (N=74)	69.3%	4.3		
Diagnostic tests				
One or more tests (N=127)	68.9%	4.0	.493	.623
No tests completed (N=33)	69.3%	3.3		
Subject age				
50 years or over (N=66)	68.8%	4.9	–1.00	.319
Under 50 years (N=94)	69.4%	2.6		

quently noted and rarely noted red flag items. For example, a patient who has a history of infection may not realize that his or her back pain may be associated with an infection located elsewhere in the body[18]. The case report by Boeglin[10] is an example of such a case: A patient with LBP, subsequently diagnosed with vertebral osteomyelitis, initially denied significant medical history but later revealed to a rheumatologist a history of chronic urinary tract infections. Another potential explanation for the discrepancy in documentation across items may relate to the construct of the standardized clinic patient intake questionnaire. Consider the example of bladder dysfunction, an item found on the intake questionnaire utilized at the participating clinics and an item that was documented by all therapists. Only 13.8% of the time was this potential red flag documented specifically from the oral interview, with the remainder documented on the patient questionnaire. Conversely, a history of a recent infection is not included as an item on the patient intake questionnaire and was never documented by the participating physical therapists. Thus, a more comprehensive patient self-report questionnaire may augment the history taken verbally by physical therapists and thus enhance the completeness of the medical screening of patients[24,29]. Lastly, some physical therapists may not be aware of the current recommended screening guidelines in their entirety for patients with low back pain.

No significant differences were found in the level of therapist comprehensiveness of documentation when comparing patients who 1) were referred by a generalist versus a specialist physician, 2) had no diagnostic tests completed versus those with diagnostic tests completed, 3) were aged 50 years and over versus those under age 50 years, and 4) were referred with a specific diagnosis versus a diagnosis of low back pain. Over all, these results suggest that the therapists in this study undertook a similar history-taking and red flag documentation approach for all patients. We interpret this as evidence that the therapists did not make any assumptions that patients who had a specific diagnosis, were referred by a specialist physician or had had diagnostic imaging done related to their LBP had been screened for red flags any more thoroughly than any other patient.

The study results indicate that investigating patient red flag documentation by therapists is relevant considering that in the red flag items that were documented, positive responses to the red flag questions occurred with approximately 45% of the items. However, this level of positive response noted by percentage must be interpreted carefully. For example, while a positive response for unexplained weight loss was documented in 6 out of 8 charts (75%) where it was queried, this red flag item was documented in only 5% of all charts. Therefore, the calculated 75% positive response rate is not necessarily an accurate reflection of the frequency of weight loss noted by our patients with low back pain. For future studies, investigating how the red flag findings influenced the therapists' clinical decision-making related to the examination process, differential diagnosis, and ultimately the subsequent actions taken, if any, would be of interest.

Limitations of this study include limited external validity as the results can only apply to similar physical therapists (with regard to experience, training, and education), to similar subjects (including demographics and chief complaint being low back pain or a related ICD-9 code), in similar settings, and with a similar examination documentation system. Another limitation of this study is the issue of potential

discrepancies between what information was documented by the therapists versus what information was actually gathered during the examination process. Every positive or negative answer from the patient may not necessarily have been documented. Lastly, for a variety of reasons, the patient examination and evaluation process may extend beyond the first patient encounter leading to red flags being noted at the second or third patient visit. However, because timely referral to other practitioners when patients present with red flags is an important component of safe practice and a majority of patient examination data is collected during the initial visit, this study described only information that was documented during the initial patient encounter. Future studies could investigate at what stage patient referrals are more likely to occur, i.e., at the initial visit or subsequent visits. This study also did not consider the documentation of physical examination red flag findings based in part on the fact that a majority of the red flag items noted in the low back pain guidelines would be collected during the history[5,25,29,34]. Despite these noted limitations, this retrospective chart review provides information not previously reported and adds to the body of knowledge describing medical screening, red flag documentation, and physical therapy practice.

CONCLUSION

It is important that the physical therapy profession describe the comprehensiveness of red flag documentation for patients with LBP as other health care professions have done[33,36-38]. Although several cases have been published describing physical therapists referring patients to physicians with subsequent diagnosis of medical disease[3,10,12,31,39], to the authors' knowledge this is the first study published that investigates the documentation of physical therapist red flag examination findings for patients with LBP. This study lays the groundwork for future study and provides a benchmark for the comprehensiveness of therapist red flag documentation for the largest outpatient population seeking services from physical therapists, those with LBP. The results also identify potential gaps in the documentation of specific red flag findings with suggested strategies to promote more comprehensive documentation. Gaps in red flag documentation identified in this study included weight loss, recent infection, and fever/chills. The regular use of a thorough patient intake questionnaire and/or an evaluation form may promote more comprehensive documentation by physical therapists for patients with LBP. ■

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