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Ordering of diagnostic imaging by physical therapists: a multi-center analysis of successful implementation

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ABSTRACT

Objective: The profession of physical therapy in the United States has evolved significantly since the American Physical Therapy Association introduced Vision 2020, advocating for consumers' direct access to physical therapy services. As the use of direct access expands, it becomes essential to examine successful models and resources, such as those that allow physical therapist referral for diagnostic imaging. This study aims to report the utilization, appropriateness, and reimbursement for diagnostic imaging referrals made by physical therapists during routine care across multiple health care organizations.

Methods: This study was a retrospective observational study of patients seeking care for neuromusculoskeletal conditions at ambulatory physical therapy clinics at three healthcare organizations. Data from each organization related to physical therapist referral for diagnostic imaging was reviewed to determine utilization rate, appropriateness, and reimbursement. American College of Radiology (ACR) criteria were used to determine appropriateness of diagnostic imaging referral.

Results: Seventy-five physical therapists signed 596 referrals for diagnostic imaging during 61,012 episodes of routine care. The utilization rate was 9.8 diagnostic imaging referrals per 1000 episodes of care. Ninety-one percent of the referrals were consistent with evidence based ACR guidelines and deemed appropriate. There were no instances of insurance denial when a physical therapist signed the referral for diagnostic imaging.

Conclusion: Physical therapists with privileges to directly refer for diagnostic imaging did so judiciously and followed ACR guidelines when referring patients for imaging. The absence of insurance reimbursement claim denial contrasts a common concern about physical therapist referral for diagnostic imaging. Physical therapists referred for appropriate imaging studies and are unlikely to contribute to diagnostic imaging overutilization.

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Introduction

In 2000, the American Physical Therapy Association (APTA) published Vision 2020 which advocated for consumers having direct access (DA) to physical therapy services, for physical therapists to hold all privileges of autonomous practice and for physical therapists to be the practitioners of choice for patients/clients with musculoskeletal conditions [1].

The profession of physical therapy in the United States (U.S.) has indeed seen significant advances over the last two decades. Since 2015, the entry level degree in the U.S. has been at the doctoral level [2]. As of 2016, the majority of the physical therapy workforce (55%) now holds doctoral degrees [3].

Today, some version of DA is available in all 50 states, with 21 states having essentially no restrictions on consumer access to physical therapy care [4]. Physical therapists are increasingly evaluating and treating patients with various musculoskeletal disorders without a referral from another healthcare provider.

Additionally, some healthcare systems are now placing physical therapists in primary care roles and using them to help triage orthopedic conditions in urgent care centers or the emergency department [5–7].

Internationally, the World Confederation for Physical Therapy states that 'physical therapy entry-level education prepares physical therapists to be primary contact autonomous practitioners, able to examine/assess, evaluate, diagnose, intervene/treat, determine outcomes and discharge patients/clients without referral from other health professions or third parties' [8].

As increasingly more physical therapists step into direct access roles in the United States, it may be prudent to explore the resources used in successful long-standing direct access models such as those used in the U.S. military and in other countries [9–16].

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The U.S. military has used physical therapists very successfully as first-contact providers for decades [9]. Physical therapists that function in this model of care routinely make decisions related to specialty referral, have the ability to prescribe some medications and directly refer for diagnostic imaging studies, such as plain film radiography, magnetic resonance imaging (MRI) and Computerized Tomography (CT scan) [9].

The ability for physical therapists to refer for diagnostic imaging studies is now an established practice model in some countries such as Australia, Canada, the United Kingdom, the Netherlands, Norway, and South Africa [17–20].

In order to maintain patient safety, it is incumbent upon each physical therapist to determine when a patient's condition falls outside their scope of practice and to refer the patient to an appropriate healthcare provider when indicated. We believe diagnostic imaging can be an invaluable tool in this process and at times, is the most pertinent resource needed to ensure ongoing patient safety.

The potential for overuse

As the role of diagnostic imaging in physical therapy practice is explored further, we should be mindful of the ever-present danger of overutilization of this resource. For example, in the U.S., inappropriate use of diagnostic imaging to manage low back pain has been cited as one of the top five practice patterns to address that would have the greatest impact on improving care while reducing cost [21].

There also may be a serious misunderstanding related to overuse of diagnostic imaging by different healthcare providers. For instance, a January 2015 study published in the Journal of the American Medical Association showed that non-physician providers ordered diagnostic imaging studies more often than their physician counterparts [22]. However, the study specifically looked at referral patterns for nurse practitioners and physician assistants only and did not include physical therapists. Unfortunately, the results of the study have been used by the American College of Radiology (ACR) leadership to lobby *against* physical therapists referring for diagnostic imaging studies [23]. While caution is indeed warranted on this topic, it is unwise to make such a significant over-generalization of clinical research findings. Data is urgently needed to mitigate others from reaching the same unfounded conclusions regarding physical therapist practice.

Evidence of physical therapists adhering to established referral guidelines and exercising judicious use is limited but overall, very supportive [14,24,25]. Keil and colleagues reviewed 5 years of imaging referrals made by PTs and determined that over 90% of orders were in agreement with established clinical guidelines and overall imaging utilization rates were just 12.5% [24]. Additionally, the authors noted that in roughly a third of all cases, physical therapy intervention was appropriately paused or discontinued altogether based on the results of imaging.

Mabry and colleagues evaluated imaging referral rates among advanced practice military physical therapists compared with traditional family practice providers and determined physical therapists referred for imaging roughly 17% less frequently than their family practice counterparts [26]. Advanced practice physiotherapists in the United Kingdom refer for radiographs and MRI at rates of just 13% and 10%, respectively [16].

A direct comparison to other first-contact providers who see patients with similar conditions was not available; however, among primary care physicians who manage back pain, imaging rates as high as 25% have been reported [27–30].

We believe there is value in adding to the existing published data related to physical therapist use of diagnostic imaging studies to provide a more accurate and complete picture of how this practice privilege is being implemented by physical therapists.

The purpose of this study is to report the utilization, appropriateness and reimbursement for diagnostic imaging referrals made by physical therapists during routine care in multiple health care organizations. To our knowledge, this may be the first U.S. based study to evaluate civilian physical therapists' referral for diagnostic imaging across three separate institutions in three different states.

Methods

This study was a retrospective observational study of patients seeking care for neuromusculoskeletal conditions at ambulatory physical therapy clinics at three healthcare organizations. The three geographically distinct organizations involved in our study had no business or clinical relationships.

MedStar Georgetown University Hospital (Georgetown) is a private, not-for profit, teaching and research hospital located in Washington D.C. where physical therapy services are provided in the physical medicine and rehabilitation department. This setting primarily provides physical therapy services for musculoskeletal conditions; however, care is also provided to patients with neurologic, medical, or cardiopulmonary conditions. Physical therapists who complete competencies have organizational authority to sign referrals for any diagnostic imaging study they feel is appropriate [31].

St. Luke's University Health Network (SLUHN, Bethlehem, PA) includes 51 clinic locations that primarily provide care for musculoskeletal conditions, but also provide care to patients with neurologic, pelvic health, and pediatric conditions. The St. Luke's

Comprehensive Spine Program includes 38 of those clinic locations that offer primary care for orthopedic spine conditions; and 12 of those clinics have physical therapists enrolled in the advanced imaging cohort. This cohort was selected to provide regionally based care to support all Comprehensive Spine providers and to closely monitor the utilization, appropriateness, and reimbursement of diagnostic imaging studies ordered by the cohort. Physical therapists were eligible for this cohort if they had legal authority to see patients without a referral. Participants were selected based upon location and evidence of continuing competence.

University of Wisconsin Hospitals and Clinics (UW Health, Madison, WI) includes diagnostic imaging referral as a component of the organization's direct access program for physical therapists in six sports and orthopedic clinics that primarily provide care for musculoskeletal conditions [32]. Wisconsin state statute explicitly allows a 'qualified physical therapist' the authority to sign referrals for radiograph imaging when one of the following criteria are met: holds a clinical doctorate degree in physical therapy, completed a nationally recognized specialty certification program, completed a nationally recognized residency or fellowship certified by an organization recognized by the examining board, or completed a formal X-ray ordering training program with demonstrated physician involvement" [33]. All PTs who participate in the UW Health direct access program must complete an institutional training with physician involvement and satisfy the legal qualification.

At each organization, physical therapists had the opportunity to participate in diagnostic imaging-specific professional development as a component of their continuing competence training required to maintain professional licensure. Internal trainings varied widely between organizations and were administered within the framework of each organization's established professional development strategies. While the material needed to perform these tasks are now required by the Commission on Accreditation in Physical Therapy Education (CAPTE) for all Doctor of Physical Therapy (DPT) programs, the training objectives at each organization were designed to review the knowledge, skills, and abilities to i) maintain quality of care standards ii) facilitate implementation in the clinical work system, and iii) enhance provider self-efficacy to make diagnostic imaging referrals in a clinically efficient manner.

Data recorded in each institution's clinical data warehouse were queried using relevant and necessary strategies for that particular organization. Only referrals for diagnostic imaging signed by a physical therapist were included in our analysis; referrals that were not signed by a physical therapist or signed by a physical therapist functioning as a physician extender were excluded.

At Georgetown, all records for imaging referrals made by physical therapists during the study period were retrieved. All relevant physical therapy documentation was reviewed by members of the research team in order to determine rationale for the imaging referral. Determination for appropriateness of imaging was made by applying the ACR Appropriateness Criteria to each note. If more information was needed, the individual physical therapist who placed the referral was contacted for further clarification.

SLUHN maintains an internal department registry of all diagnostic imaging referrals signed by a physical therapist. The registry was established to comply with SLUHN criterion to conduct a retrospective utilization analysis after 100 diagnostic imaging referrals. A senior PT was required to complete a case review and support the primary physical therapist's decision before the diagnostic imaging referral was signed. Additionally, the electronic medical record system at SLUHN used CareSelect (Change Healthcare, Nashville, TN) in the workflow for any clinician making a diagnostic imaging referral, regardless of provider type. CareSelect is a third party that St. Luke's used to evaluate an order against criteria set by the ACR Appropriateness Criteria to determine if the order met approved guidelines. If it did, the order would be signed as normal. If it did not, the ordering clinician was presented a best practice alert requiring order justification and possible revision before completion. CareSelect is provided by NDSC (National Decision Support Company) and consists of Imaging Appropriateness Criteria from the American College of Radiology, Society of Pediatric Radiology (SPR), American College of Cardiology (ACC), and National Comprehensive Cancer Network (NCCN). CareSelect was an institutional initiative to help assure appropriate imaging utilization from any clinician and was not specific to physical therapists.

At UW Health, a business analyst queried all outpatient physical therapy encounters occurring from 1 October 2017 to 31 March 2024 to identify referrals to the radiology department. Returned records were provided to a senior physical therapist who manually reviewed the clinical documentation associated with the imaging referral to affirm the presence of inclusion criteria and exclude any records that did not. During the manual review, the senior physical therapist determined if the referral was appropriate when the selected imaging study was classified as 'Usually appropriate' in the ACR Appropriateness Criteria. An additional review was performed by an independent reviewer if the clinical documentation made the appropriateness determination difficult, or unique factors of the clinical scenario were discrepant with published ACR variants.

Physical therapists with authority to sign referrals for diagnostic imaging in their respective organization

were considered eligible. A referral for diagnostic imaging signed by an eligible physical therapist was considered the primary outcome. Multiple body regions, imaging projections, or procedures resulting from a single clinical encounter were considered as one referral. Additional variables were captured in order to evaluate a system perspective including professional characteristics of the referring physical therapist, appropriateness of the imaging referral, payment received for diagnostic imaging services, and unique episodes of care provided by eligible physical therapist. Clinical documentation associated with each referral was manually reviewed to determine appropriateness.

The ACR Appropriateness Criteria are guidelines developed and reviewed annually by expert panels in diagnostic imaging, interventional radiology and radiation oncology. The appropriateness of an imaging study is categorized in three possible ways: 'usually appropriate', 'may be appropriate', and 'usually not appropriate' [34]. The referral was considered appropriate when the imaging modality selected for the clinical situation was 'Usually appropriate' by ACR Appropriateness Criteria.

The utilization rate was determined for each organization by calculating the number of referrals divided by the total unique episodes of care provided by physical therapists who made at least 1 referral. An episode of care was identified by a physical therapy evaluation Common Procedural Terminology (CPT®) code and included all subsequent clinical encounters following the evaluation, without a reevaluation CPT® code.

Payment for diagnostic imaging services were retrieved from each organization's billing records and were included when charges or payments could be directly attributed to the diagnostic imaging services associated with the referral signed by the physical therapist.

Results

Table 1 provides the professional characteristics for physical therapists who signed at least one diagnostic imaging referral. In all organizations, the majority of physical therapists who made a referral earned a DPT degree and were board-certified clinical specialists in orthopedics or sports. Seventy-five physical therapists signed 596 referrals during routine care. A total of 61,012 episodes of care were provided at the involved organizations during the time these referrals were made. The overall utilization rate was 9.8 per 1000 episodes of care.

Five hundred forty (91%) of the referrals included in this study were consistent with evidence-based guidelines and deemed appropriate. Results for each organization are provided in Table 2. All billing records were available at Georgetown, SLUHN, and UW Health. There were no instances of insurance claim denial when the physical therapist signed the referral for diagnostic imaging.

Discussion

The purpose of this study was to report the utilization, appropriateness and reimbursement for diagnostic imaging referrals made by physical therapists during routine care in multiple health care organizations. We believe this is the first U.S. based study to evaluate diagnostic imaging referral practices by civilian physical therapists in three separate institutions, across three different states. Our combined imaging data covers over 20 years of referral for imaging practice by physical therapists. We also believe this may be the largest data set specifically reporting on imaging referral by civilian physical therapists.

Utilization rate

Our collective findings indicate that physical therapists who have privileges to order diagnostic imaging studies are extremely judicious in their use of this resource. An overall utilization rate of 1% is noteworthy and we believe may be the result of several key factors.

Firstly, our study included all episodes of care rendered by physical therapists who made at least one imaging referral. Unfortunately, we were unable to

Table 1. Characteristics of the organization and physical therapists with authority to refer patients for diagnostic imaging.

	UW Health (10/2017–3/2024)	SLUHN (1/2020–8/2023)	Georgetown (1/2012–7/2023)
Clinics	6	12	1
Physical Therapists who signed ≥ 1 referral for imaging	47	13	15
Highest PT degree earned during study period by PTs who referred			
Bachelors, n (%)	3 (6%)	0	0
Masters, n (%)	8 (17%)	0	1 (7%)
Doctorate, n (%)	36 (77%)	13 (100%)	14 (93%)
Board-Certified Specialist (active during study period)			
OCS, n (%)	14 (30%)	11 (85%)	13 (87%)
SCS, n (%)	9 (20%)	2 (15%)	2 (13%)

Abbreviations: University of Wisconsin Hospitals and Clinics, UW Health; St. Luke's University Health Network, SLUHN; MedStar Georgetown University Hospital, Georgetown; orthopedic certified specialist, OCS; sports certified specialist, SCS.

Table 2. Diagnostic imaging referrals.

	UW Health (10/2017–3/2024)	SLUHN (1/2020–8/2023)	Georgetown (1/2012–7/2023)
Total number of Imaging Referrals	405	49	142
Radiographs	405 (100%)	14 (29%)	99 (70%)
Advanced Imaging (CT, MRI, Dexa, etc.)	Not permitted by state statute	35 (71%)	43 (30%)
Episodes of care per clinicians who made at least 1 imaging referral*	45,547	1,396	14,069
Utilization rate for clinicians who made at least 1 referral (per 1,000 evaluations)**	0.89% 8.9 per 1000 NEW patients	3.5% 35 per 1000 spine evaluations	1.0% 10 per 1000 NEW patients
Appropriateness***	359 (89%) ACR Appropriateness 'Usually Appropriate'	49 (100%) National Decision Support Company CareSelect (G1004)	132 (93%) ACR Appropriateness 'Usually Appropriate'
Number of Insurance Claims Denied **** N (%)	0 (0%)	0 (0%)	0 (0%)

*An episode of care was identified by the evaluation and included all subsequent clinic visits following the evaluation, without reevaluation.
**Imaging referrals/episodes of care.
***Met American College of Radiology (ACR) Appropriateness Criteria or CareSelect threshold for appropriateness.
****Insurance claims submitted and denied because test was ordered by a PT.
Abbreviations: University of Wisconsin Hospitals and Clinics, UW Health; St. Luke's University Health Network, SLUHN; MedStar Georgetown University Hospital, Georgetown; computed tomography, CT; magnetic resonance imaging, MRI; dual x-ray absorptiometry, DEXA.

consistently distinguish between patients who were referred to physical therapy after seeing another healthcare provider from patients who self-referred via direct access. Only at Georgetown was this data available. We believe that a lower utilization rate would be expected for patients who have already seen another healthcare provider who also has privileges to refer for imaging. Indeed, our data from Georgetown indicates an imaging utilization rate of 1% for referred patients and 7% for patients seen via direct access. This supports the notion that the ability for physical therapists to refer for diagnostic imaging studies may be even more relevant when seeing patients via direct access.

Secondly, our overall low utilization rate may not account for all imaging received by patients when the process was initiated by a physical therapist. When a physical therapist determines imaging is clinically warranted, they may still choose to make a diagnostic imaging recommendation to the patients' physician or other qualified health care provider (e.g. nurse practitioner, physician assistant, podiatrist) who then makes a referral for the imaging study. National surveys of U.S. physical therapists indicate diagnostic imaging recommendations occur frequently during routine practice [25,35]. In these instances, the imaging study was the result of a process initiated by the physical therapist's clinical decision making. It is impossible to know precisely how often this may occur, but we recognize that adding in these types of referrals would result in a higher utilization rate overall.

Additionally, we believe that some patients may seek out a physician or physician extender when they themselves feel that imaging may be necessary as patients may be unaware that physical therapists could also meet this need.

Finally, we acknowledge that the type of physical therapy clinic may significantly impact imaging utilization rates. Our study included 19 community-based outpatient physical therapy clinics that service the needs of a large variety of patients. In contrast, Crowell and colleagues reported imaging utilization rates at a direct access acute sports injury clinic of 40% for plain film x-rays and 8% for advanced imaging [14]. One would expect a higher imaging utilization rate when caring for patients who have sustained an acute sports-related injury. It should be noted that in spite of the higher utilization rate in their study, appropriateness was still recorded at 83% overall [14].

Appropriateness

We utilized well-established evidence-based guidelines to assess appropriateness of imaging referrals according to the ACR Appropriateness Criteria which is the industry standard. The evidence-based guidelines intend to promote the appropriate use of diagnostic imaging by all health care providers. Our analysis maintained the highest quality standard because only referrals that met the highest appropriateness rating were classified as appropriate.

These collective findings indicate that 91% of all imaging referrals signed by 75 physical therapists across 3 separate institutions were considered appropriate. The heterogeneity of physical therapists' training, practice experience, and provider beliefs as well as the diversity of patient values, expectations, and medical conditions represented in this multi-organizational study provides strong justification that physical therapist referrals for diagnostic imaging are clinically justified.

Reimbursement

We analyzed 596 imaging referrals signed by physical therapists in 3 separate institutions across 3 different states. Decisions related to covered

services are unique to each patient's unique insurance plan. Despite this significant diversity by company, state, geographic region and variation in policy, the results of our study indicate no denials of claims for imaging services that were signed by physical therapists when routine pre-approval processes were followed by the imaging center. This finding is significant for both patients and physical therapists as we are not aware of a single incident in which a patient was responsible for covering the cost on an imaging test as a result of a denied claim when the referral was signed by a physical therapist.

All physical therapist referrals for imaging were processed by each imaging center in a manner consistent with referrals made by any other referring provider. It is not uncommon for specific criteria to be required by an individual's insurance plan for an imaging study to be reimbursed, regardless of condition, particularly when advanced imaging is being considered (e.g. MRI, CT). For instance, a plan may require a consultation from a medical doctor who is considered a specialist in order for advanced imaging to be reimbursed. Policy requirements exist regardless of medical specialty and were not unique to physical therapist signed referrals.

Limitations

There were several limitations to our study. Even though we did apply accepted published guidelines when evaluating appropriateness for imaging referrals, we understand there is risk of bias by evaluating the data ourselves. Having an independent third party evaluate appropriateness would be ideal.

Our study also did not include additional provider characteristics such as years of experience or post-professional education (residency, fellowship training) nor did we evaluate how those factors may have impacted diagnostic imaging use. Our study did not evaluate how the results of diagnostic imaging testing impacted the patient trajectory (e.g. continue physical therapy, refer for surgical consultation, consult another specialty)

Finally, we did not provide a list of specific clinical competencies used by the 3 institutions in our study. We understand there could be value in reporting that level of detail, especially for those who may be interested in using similar competencies; however, it is also our belief, which is supported by Mabry and colleagues [25], that most physical therapists possess the required skills and knowledge needed to make imaging referral decision upon graduating from an accredited DPT program and additional competencies may not be necessary.

Conclusion

This analysis demonstrates that physical therapists with privileges to directly order diagnostic imaging studies exercise both extremely judicious and clinically appropriate use of this practice resource. Additionally, we found no denials of claims for these services when routine pre-approval processes were followed.

We believe that our findings stand in stark contrast to the well-intended but inaccurate assumption that granting physical therapists the authority to refer patients for diagnostic imaging studies will contribute to the overutilization problems reported in the literature among other healthcare providers. We are not aware of any published data that supports the notion that physical therapists with imaging referral privileges overutilize this resource. To the contrary, it is our opinion that every peer-reviewed study that has examined imaging utilization rates and appropriateness by physical therapists has shown similar positive results.

These findings could be useful for other jurisdictions or organizations interested in granting physical therapists the authority to refer for diagnostic imaging studies directly.

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References

[1] American Physical Therapy Association. Vision statement for the physical therapy profession established. Available from: https://timeline.apta.org/timeline/vision-statement-for-the-physical-therapy-profession-established/. 2023.

[2] American Board of Physical Therapy Residency & Fellowship Education. Aggregate Program Data. 2019. Accessed 16 February 2025 https://www.apta.org/globalassets/abptrfe/data-and-outcomes/2019-residency-fellowship-fact-sheet.pdf .

[3] American Physical Therapy Association. Physical therapist member demographic profile 2016–2017. 2019. Available from: https://www.apta.org/contentassets/7e055270888542cbbbfe20b1811d099b/physical-therapist-demographics-profile.pdf

[4] American Physical Therapy Association. Levels of patient access to physical therapist services in the U. S. 2023 [cited 2024 Jan 24]. Available from: https://www.apta.org/advocacy/issues/direct-access-advocacy/direct-access-by-state

[5] De Gruchy A, Granger C, Gorelik A. Physical therapists as primary practitioners in the emergency department: six-month prospective practice analysis. Phys Ther. 2015;95(9):1207–1216. doi: 10.2522/ptj.20130552

[6] Lebec MT, Jogodka CE. The physical therapist as a musculoskeletal specialist in the emergency department. J Orthop Sports Phys Ther. 2009;39(3):221–229. doi: 10.2519/jospt.2009.2857

[7] Fleming-Mcdonnell D, Czuppon S, Deusinger SS, et al. Physical therapy in the emergency department: development of a novel practice venue. Phys Ther. 2010;90(3):420–426. doi: 10.2522/ptj.20080268

[8] World Confederation for Physical Therapy. Direct access and patient/client self-referral to physical therapy. 2019. Available from: https://world.physio/sites/default/files/2020-04/PS-2019-Direct-access.pdf

[9] Greathouse D, Schreck R, Benson C. The united states army physical therapy experience: evaluation and treatment of patients with neuromusculoskeletal disorders. J Orthop Sports Phys Ther. 1994;19(5):261–266. doi: 10.2519/jospt.1994.19.5.261

[10] Lt EW, Kelly MC, Usnr. A team approach to the treatment of musculoskeletal injuries suffered by navy recruits: a method to decrease attrition and improve quality of care. Mil Med. 1997;162(5):354–359. doi: 10.1093/milmed/162.5.354

[11] Benson CJ, Schreck RC, Undewood FB, et al. The role of army physical therapists as nonphysician health care providers who prescribe certain medications: observations and experiences. Phys Ther. 1995;75(5):380–386. doi: 10.1093/ptj/75.5.380

[12] Moore JH, Mcmillian DJ, Rosenthal MD, Weishaar MD. Risk determination for patients with direct access to physical therapy in military health care facilities. J Orthop Sports Phys Ther. 2005;35(10):674–678. doi: 10.2519/jospt.2005.35.10.674

[13] McGill T. Effectiveness of physical therapists serving as primary care musculoskeletal providers as compared to family practice providers in a deployed combat location: a retrospective medical chart review. Mil Med. 2013;178(10):1115–1120. doi: 10.7205/MILMED-D-13-00066

[14] Crowell MS, Dedekam EA, Johnson MR, et al. Diagnostic imaging in a direct-access sports physical therapy clinic: a 2-year retrospective practice analysis. Int J Sports Phys Ther. 2016;11(5):708–717.

[15] Dininny P. More than a uniform; the military model of physical therapy. PT Mag. 1995;3:40–48.

[16] Rabey M, Morgans S, Barrett C. Orthopaedic physiotherapy practitioners: surgical and radiological referral rates. Clin Governance An Int J. 2009;14(1):15–19. doi: 10.1108/14777270910933424

[17] Australian Physiotherapy Association. Position statement: scope of practice. 2009. Available from: https://australian.physio/tools/clinical-practice/scope-practice

[18] Physical therapists profession regulation. 2023. Available from: http://www.qp.alberta.ca/documents/Regs/2011_064.pdf

[19] Preston W, Murray M. Clinical imaging requests from non-medically qualified professionals. 2021. Available from: https://www.rcn.org.uk/Professional-Development/publications/rcn-clinical-imaging-requests-uk-pub-009-108

[20] Hazle C, Kirsch N, White D, et al. Diagnostic and procedural imaging in physical therapist practice. 2016. Available from: https://www.orthopt.org/uploads/content_files/files/DxProcImagPhysTherPractice_FINAL.pdf

[21] Good Stewardship Working Group. The "Top 5" lists in primary care. Arch Intern Med. 2011;171(15):1385. doi: 10.1001/archinternmed.2011.231

[22] Hughes DR, Jiang M, Duszak R. A comparison of diagnostic imaging ordering patterns between advanced practice clinicians and primary care physicians following office-based evaluation and management visits. JAMA Intern Med. 2014;175(1):101–107. doi: 10.1001/jamainternmed.2014.6349

[23] Thorwarth W. Position statement – American college of radiology. 2023. Available from: https://www.acr.org/-/media/ACR/NOINDEX/Advocacy/SOP/ACR-Letter-Opposing-SSB-1046.pdf

[24] Keil AP, Baranyi B, Maurer A, et al. Ordering of diagnostic imaging by physical therapists: a 5-year retrospective practice analysis. Phys Ther. 2019;99(8):1020–1026. doi: 10.1093/ptj/pzz015

[25] Mabry LM, Severin R, Gisselman AS, et al. Physical therapists are routinely performing the requisite skills to directly refer for musculoskeletal imaging: an observational study. J Man Manipulative Ther. 2022;30(5). doi: 10.1080/10669817.2022.2106729

[26] Mabry LM, Notestine JP, Moore JH, et al. Safety events and privilege utilization rates in advanced practice physical therapy compared to traditional primary care: an observational study. Mil Med. 2019. doi: 10.1093/milmed/usz176

[27] Kale MS, Bishop TF, Federman AD, et al. Trends in the overuse of ambulatory health care services in the

united states. JAMA Intern Med. 2013;173(2):142. doi: 10.1001/2013.jamainternmed.1022

[28] Tan A, Zhou J, Kuo Y, et al. Variation among primary care physicians in the use of imaging for older patients with acute low back pain. J Gen Intern Med. 2015;31 (2):156–163. doi: 10.1007/s11606-015-3475-3

[29] Pham HH, Landon BE, Reschovsky JD. Rapidity and modality of imaging for acute low back pain in elderly patients. Arch Intern Med. 2009;169(10):972–981. doi: 10.1001/archinternmed.2009.78

[30] Smith-Bindman R, Miglioretti DL, Johnson E, et al. Use of diagnostic imaging studies and associated radiation exposure for patients enrolled in large integrated health care systems, 1996–2010. JAMA Intern Med. 2012;307(22). doi: 10.1001/jama.2012.5960

[31] Keil A, Brown SR. US hospital-based direct access with radiology referral: an administrative case report. Physiother Theory Pract. 2015;31(8):594–600. doi: 10.3109/09593985.2015.1060658

[32] Boissonnault WG, Badke MB, Powers JM. Pursuit and implementation of hospital-based outpatient direct access to physical therapy services: an administrative case report. Phys Ther. 2010;90(1):100–109. doi: 10.2522/ptj.20080244

[33] Wisconsin State Legislature. Chapter PT 10: ordering X-rays. PT 10.01–10.02. 2017. Available from: https://docs.legis.wisconsin.gov/code/admin_code/pt/10.pdf

[34] American College of Radiology. ACR appropriateness criteria. Available from: https://www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria. 2024.

[35] Rundell SD, Maitland ME, Manske RC, et al. Survey of physical therapists' attitudes, knowledge, and behaviors regarding diagnostic imaging. Physical Therapy. 2024;101(1):1–11. doi: 10.1093/ptj/pzaa187