DIAGNOSTIC AND PROCEDURAL IMAGING
IN PHYSICAL THERAPIST PRACTICE

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Acknowledgements

The authorship committee acknowledges and appreciates the access and assistance to those providing historical data toward assembling this document.

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INTRODUCTION

Health care and health care payment are evolving to be more value-based and consumer-centered. Physical therapist (PT) practice must evolve to meet the needs of society in allowing for more efficient care in a cost sensitive manner while striving for optimal outcomes. The scope of PT practice with direct access has demonstrated enhanced quality of patient care, high levels of patient satisfaction, and reduced costs. A vital function of first-contact practitioners is the referral to other clinicians and services for optimal patient management, including access diagnostic imaging. Within established practice, PTs have for more than two decades supplemented their clinical assessments of patients with ultrasound imaging. Historically, PTs have successfully employed imaging in multiple, but limited sectors of health care delivery. Imaging instructional content is now foundational in PT educational programs and mandated by accreditation standards, allowing for basic competencies in imaging use and decision making at entry-level practice. Effective use of imaging in daily PT practice is validated by a multitude of entries in the peer-reviewed literature. There is a strong evidence-based foundation and need to support widespread adoption of imaging in PT practice. This document outlines historical perspectives, proposes greater incorporation of imaging by PTs in systematically improving patient management and cost containment, and presents evidence in support of that proposal.

HISTORICAL AND CURRENT OVERVIEW

Diagnostic Imaging

The role of PTs ordering or referring for diagnostic imaging has been in existence for several decades. The most notable example is the United States military, where since 1972, PTs have practiced as direct access providers with imaging privileges.[1,2] Brought on by an overwhelmed health care system, providers and administrators recognized that PTs were needed as physician extenders to manage patients with nonsurgical, musculoskeletal disorders in a timely fashion. In the 4 plus decades since, PTs in the military system have been recognized as the musculoskeletal providers of choice and an invaluable asset to the health care team. The value of this important role is enhanced by referring/ordering appropriate diagnostic imaging.

Having PTs serve in physician-extender roles has been shown to be an effective method in reducing the number of extraneous images ordered while maintaining high levels of diagnostic accuracy.[3] Physical therapists have been shown to have equivalent abilities as orthopaedic surgeons in diagnostic accuracy of musculoskeletal conditions and to categorize patients for courses of care or referral, including indications for imaging.[3,4] Further, PTs have been found to be more accurate diagnostically than non-orthopaedic providers in evaluating patients with musculoskeletal conditions.[3] Additionally, PTs in the physician-extender role have demonstrated equivalent patient outcomes, a greater than 50% reduction in radiographic examinations, and higher levels of patient satisfaction, as well as increases in access to orthopaedic surgeons and PT job satisfaction.[5] In a retrospective study over a 40-month period in a military facility, data were collected on over 50,000 new patients seen in direct access military PT clinics. Over this period, there were no reported adverse events or their sequelae.[6]

The military's long track record of PTs functioning successfully in the physician-extender role demonstrably refutes concerns among policy-makers, who may believe that PTs seek to operate in an allegedly untested practice model.[7] This model does not exist solely within the military, as other government agencies have also adopted similar PT practice models based on clear evidence of benefits. Many PTs in the Public Health Service, Indian Health Service, the Veterans Administration Health System, and the Bureau of Prisons now have imaging privileges.[8]

Multiple studies have highlighted the need for PTs to undertake regular medical screening along with detailed clinical examinations and assessments of patients initially presenting for PT management.[9-18] Similarly, PTs appropriate use of screening and examination processes, including the recognition of the indications for imaging, has been documented for 4 decades.[2,5] While much of this has occurred within the military model of practice, examples also exist in civilian settings in the United States and abroad.[19-22] Georgetown University Hospital granted imaging order privileges by PTs in January 2012.[22] Kaiser-Permanente Northern California, a large nonprofit managed care organization, has provided imaging privileges for PTs for almost two decades.[23] The University of Wisconsin Hospital and Clinics has also extended the professional privilege of plain radiography to PTs.[7] Inappropriate use of these privileges or negative patient outcomes associated with this privilege and increased responsibility has not been reported to date. These examples offer evidence of the benefit of imaging in PT practice while simultaneously achieving efficiency in patient care.

Across the globe, inclusion of imaging in PT practice is neither isolated nor novel. Among the countries in which imaging is standard within PT practice are Australia,[24] Canada (Provinces of Alberta, Manitoba, New Brunswick),[25,26] the United Kingdom,[27] Netherlands,[28] Norway,[29,30]

and South Africa.[31] Consistently, physical therapy utilization in such roles has proven successful in patient satisfaction, reduction of wait time for care, fewer surgical referrals, and decreases in costs of care.[5,19-21,32] Notably, these studies have demonstrated PTs regularly utilize imaging appropriately within direct access and diagnostic management contexts.[3,5,19,20,32] Additionally, a reduction of imaging without compromise of quality of care has led to decreases in exposure to medical imaging using ionizing radiation and the associated risks, enhancing patient safety.[5,19-21,32]

Furthermore, most state PT practice acts in the United States mandate patient examinations, which inherently includes medical screening and recognition of indicators of conditions beyond the scope of PT practice.[33] The definition of physical therapy, according to the language of the majority of state practice acts, typically includes terminology such as "examination," "evaluation," "tests" (or "testing"), and "assessment."[34] Thus, PTs are legally bound to seek and assimilate into their patient data multiple sources of information to formulate and execute plans of care.[35]

Within the United States, the use of evidence-based, consensus derived guidelines, including the American College of Radiology (ACR) Appropriateness Criteria, are the foundation for decision making for the use and selection of diagnostic imaging.[36] The ACR Appropriateness Criteria and similar guidelines are based on simple patient data, which are routinely collected at the time of initial PT evaluation and in subsequent interactions.[37] The instruction in the acquisition of this information has long been within the *Normative Model of Physical Therapist Professional Education*[38] and is mandatory content for instruction in PT education by accredited programs.[39]

These patient data[36] include the following:

(1) age,

(2) presence or absence of trauma,

(3) mechanism of injury,

(4) presence or absence of prior surgery,

(5) presence or absence of risk factors,

(6) physical appearance,

(7) findings of pain provocation or physical function tests,

(8) other imaging results,

(9) ability or inability to weight bear, and

(10) tenderness to palpation.

This information is routinely gathered by PTs and typically applied in other decision making processes of patient management. The utilization of this information toward imaging, therefore, is not novel, but a logical and integral part of regular PT practice.[35]

The usage of imaging guidelines and judgement in patient-centered care by PTs has been demonstrated to be appropriate in clinical studies and in numerous published case reports. In an investigation of the application of lower extremity imaging guidelines for possible fractures, PTs and orthopaedic surgeons demonstrated equivalent competencies for identifying those individuals warranting imaging for possible fractures.[40]

Numerous case reports exist validating physical therapy use of clinical criteria in medical screening, daily decision making, and specifically, with imaging being prudently incorporated in guiding in overall care. As of this writing, in excess of 150 case reports of imaging in physical

therapy have been published in peer-reviewed literature.[41,42] A key journal of the profession has had multiple special issues devoted to imaging.[43-45] At least 4 textbooks have been authored or coauthored by PTs on the subject of imaging and specifically directed toward physical therapy application of imaging in clinical practice with the earliest being published in 1997.[46-49]

The use of imaging by PTs, therefore, has a fundamental and historical basis in practice and is currently well-established in present day educational curricula, resulting in an excellent foundation for wider adoption by PTs as recognized by legal jurisdictions, local or institutional authorities, and payers.

Ultrasonography

Published research describing PT use of ultrasound imaging in patient management has been growing since the 1980s.[43,44] The practicality of incorporating ultrasound at the point-of-care has been greatly enhanced with improvement in ultrasound technology resulting in smaller machines, higher and improved resolution, and much lower equipment costs.[50] The PT point-of-care application of ultrasound can be described in two broad categories: diagnostic and procedural. Diagnostic ultrasound in point-of-care application is by definition using ultrasound as one component of the diagnostic process. The PT utilizes information gained from ultrasound combined with the patient history and physical examination findings along with other relevant data to arrive at a diagnosis. Point-of-care diagnostic ultrasound is distinct from ultrasound examinations performed by a consultant who does not participate in patient care beyond the ultrasound examination and rendering a report to the treating clinician.[51,52]

Procedural ultrasound in PT practice encompasses many interventions that include but are not limited to patient biofeedback, neuromuscular re-education, monitoring real-time changes in morphology and movement during interventions, documenting change in clinical conditions, using ultrasound to localize target areas for manual interventions and physical agents, and using ultrasound to guide needle placement in procedures such as dry needling and electroneuromyography.[51,52]

INTRAPROFESSIONAL ISSUES

Physical Therapist Education and Training

Curricular content

Imaging content is included in entry-level Doctor of Physical Therapy (DPT) education programs. A recent study of accredited PT education programs included 155 programs responding to a survey inquiring as to the imaging curricula content, representing 75.2% of the programs contacted. Of the 155 programs, 152 (98.1%) surveyed during 2013 reported imaging content in their entry-level programs either as stand-alone courses or imbedded in multiple, related courses.[53]

The survey of physical therapy educational programs revealed inconsistencies in imaging education across accredited programs, serving as an impetus for the *Imaging Education Manual*[54] and creating guidelines with suggested strategies for imaging instructional content. Additionally, the *Imaging Education Manual* was written to be consistent with accreditation standards. The initial mention of imaging in physical therapy accreditation body documents occurred in 2004.[55] Current Commission on Accreditation in Physical Therapy Education

(CAPTE) accreditation standards require imaging to be included in the curriculum of all DPT programs.[39]

The inclusion of training in ultrasound toward being an entry-level competency in physical therapy and, thus, mandatorily included in PT education is controversial and may mimic similar circumstances as existing in medical school education, including inadequate resources and time availability.[56] The value of ultrasound in care provided by physicians and PTs, however, is being increasingly recognized and educational practices are gradually changing.[51,57-60]

Competency

Since 1996, the Federation of State Boards of Physical Therapy (FSBPT) analyses of practice, upon which PT licensure examinations are derived, have identified the need for recognition of indicators for diagnostic imaging as an entry-level skill. In 1997, questions on that content have occurred in the licensure examination.[61] Each practice analysis since that time has revealed similar findings and the licensure examination has continued to integrate assessment items that include imaging content.[62-64] Currently, diagnostic and procedural imaging, as specific items, are found in the content outline of the National Physical Therapy Examination.[65] Thus, knowledge of imaging applications in patient management has been integrated into baseline competency of entry-level PT practice in the United States for two decades with increasing importance over that time.

Clinical application of ultrasound imaging by PTs is typically with post-graduate training and mentoring analogous to non-radiologist physicians.[66] The American Registry of Diagnostic Medical Sonography offers a credential in musculoskeletal sonography available to PTs.[67]

Practice, Regulatory and Payment Issues

Positions and practice standards related to imaging

The American Physical Therapy Association (APTA) Position (HOD P06-06-18-12) Autonomous Physical Therapist Practice states that practice includes "*Ability to refer to and collaborate with health care providers and others to enhance the physical therapist patient/client management*."[68] Correspondingly, the APTA Position (HOD P06-12-10-09) Diagnosis by Physical Therapists states, *"…When indicated, physical therapists order appropriate tests including but not limited to imaging and other studies, that are performed and interpreted by other health professionals. Physical therapists may also perform or interpret selected imaging or other studies…"*[69] This would imply, at a minimum, that PTs have the knowledge base sufficient to make appropriate referrals of patients for imaging tests and perform certain imaging procedures. This would encompass knowing the indications for imaging as well as when imaging is unlikely to be informative to change the course of care. Additionally, knowledge of the applicable imaging modality would also be required. The practitioners' decisions regarding imaging would be based upon the previously described patient data.

In relation to the value benefit of imaging in PT practice, as evidenced throughout this document, a related APTA position is (HOD P06-15-17-09) Delivery of Value-Based Physical Therapist Services which describes *"…the position of the American Physical Therapy Association (APTA) that physical therapists embrace and are accountable for best practice standards to provide high-quality services that promote value, and that all individuals have access to physical therapist services.*" This position further states, "*The APTA supports initiatives to promote a*

value-based system for physical therapist services that uses evidence, best practice, and outcomes for meeting the needs of individuals and the public."[70]

The FSBPT Model Practice Act of 2013 does not include affirmative language about the use of imaging for PT.[34] The use of imaging is categorized within the general description of "testing" toward diagnosis in the Model Practice Act. Additionally, the FSBPT published a resource paper in 2010 on Rehabilitative Ultrasound Imaging,[52] which concludes in part, *"…there is a historical basis, available education and training as well as an educational foundation in the CAPTE criteria, and supportive scientific evidence for including rehabilitative ultrasound imaging in the scope of practice of physical therapist, … [T]he appropriate machine settings and the ability to differentiate structures and comprehend the images obtained during rehabilitative ultrasound imaging, at this time, are not entry level skills and should require additional training."*

The American Academy of Orthopaedic Manual Physical Therapists (AAOMPT) in 2009 adopted the following statement, "*It is the Position of the AAOMPT that ultrasound imaging is within the scope of physical therapist practice*."[71] Another organization, the American Institute of Ultrasound in Medicine (AIUM) (www.aium.org) is a multi-disciplinary society dedicated to advancing ultrasound in medicine. The AIUM has two official statements which do not yet include PTs as providing and interpreting ultrasound procedures. Previously, the APTA participated in guideline development with the AIUM. The addition of PTs as ultrasound providers in their official statements is consistent with the AIUM mission.

Malpractice and professional liability

In a combined report from the CNA and the Healthcare Providers Service Organization covering claims against PTs from January 1, 2010, through December 31, 2014, there were no claims identified pertaining to diagnostic or procedural imaging by PTs.[72]

Insurance coverage for patients and clients

Private insurance companies may provide specific coverage for ultrasound imaging by PTs on an intermittent basis. Private payers only infrequently allow for ordering of diagnostic imaging by PTs, but this has been successfully accomplished in limited civilian settings.[7,22] Multiple federal mechanisms effectively exclude PTs from ordering imaging by disallowing reimbursement and do not provide for coverage of ultrasound imaging.

Private Payers

Ordering imaging is part of the PT evaluation and would be paid under the evaluation code. The work, practice expense, and malpractice expense of ordering imaging is not currently reflected in the relative value of the PT evaluation codes. Payment by private payers for PTs performing ultrasound imaging is inconsistent. Payers may, in some cases, be unaware of the specific provider completing and requesting imaging reimbursement. Many payers require practitioners to request ultrasound imaging procedures to be added to the fee schedule for their practice. Qualified PTs can bill ultrasound imaging codes for a limited or complete musculoskeletal diagnostic examination. In many cases, ultrasound imaging is an adjunct to the primary procedure, such as therapeutic exercise or neuromuscular re-education, and would not be payable as a separate procedure. Ultrasound imaging can also be billed as biofeedback, if used for that purpose.

Medicare

Current Medicare codified language does not allow for PTs to order diagnostic imaging or be reimbursed for performing ultrasound imaging. The regulations at 42 CFR 410.32 address the personnel who may order diagnostic tests under Medicare requirements. Specifically listed as allowable are physicians and non-physician practitioners, including clinical nurse specialists, clinical psychologists, clinical social workers, nurse midwives, nurse practitioners, and physician assistants. The specific language is available at: http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ClinicalLabFeeSched/downloads/410_32.pdf.

Medicaid

Medicaid coverage for allowable services typically will not exceed that provided under Medicare. Medicaid coverage is, however, variable by state, requiring inquiry from each applicable state Medicaid agency. Further information is available at: https://www.medicaid.gov/federal-policy-guidance/federal-policy-guidance.html.

Tricare

Current stipulations of Tricare do not allow for diagnostic testing as ordered by PTs nor is reimbursement provided for PTs completing ultrasound imaging. More information is available at: http://www.ecfr.gov/cgi-bin/text-idx?SID=428abfcbfa6e965d83cf3f6255375a59&mc=true&node=se32.2.199_16&rgn=div8.

Payment

Direct ordering of diagnostic imaging studies by PTs remains relatively uncommon in the civilian sector, and as such, data related to payment for these services is quite limited. Insurance entities frequently will require pre-authorization for imaging studies, especially advanced

imaging such as magnetic resonance imaging (MRI) or computed tomography (CT) scans, and a physician's order may be required in such cases.

Despite these limitations, precedent has been published that tracked payment data of claims submitted for diagnostic imaging studies (inclusive of advanced imaging) when ordered directly by PTs. During a precedent setting arrangement for PTs having imaging privileges, several different insurance plans were tracked throughout the study with no denials of claims reported.[22] Although there were no denials, if payers were aware that the studies were being ordered by PTs is unknown. Education of insurance providers regarding the benefits of PTs having imaging privileges, PTs' adherence to published imaging guidelines, and the PTs' proven judicious use of imaging are necessary steps to change the payment landscape.

Licensure and Regulation

The 53 United States jurisdictions define the regulatory scope of practice differently.[35,73] The FSBPT Model Practice Act[34] defines the parameters of patient care management that includes evaluation and examination that may require the need for imaging. The statutory authority to order imaging studies is generally separate from the authority to interpret those findings. The ability to perform certain skilled tasks, including imaging, may be granted overtly through explicit regulatory authority or denied by that same authority. More often than not there is no explicit direction and the performance of certain tasks may be permitted because they are not explicitly precluded from the scope of practice. Regulatory boards have been asked for an interpretation of statute and rules and regulations regarding PT involvement in imaging. For example, in 2010 the District of Columbia Physical Therapy Board ruled that "*physical therapists may refer a patient for diagnostic imaging to a health care provider who is qualified to perform*

such testing, provided the other conditions as set forth in the regulation are met."[74] Similarly, in August of 2012, the physical therapy board in Maryland opined that, "*It is within the scope of practice for physical therapists in Maryland to refer patients to a radiologist for radiological imaging and testing when appropriate. The interpretation of such testing must be done by a radiologist*."[75] This was reaffirmed in 2014 with the following statement added, "*Physical therapists can refer patients for radiological tests, including x-ray, MRI and CT scans*."[75] The Colorado State Physical Therapy Board issued the following in March of 2014, "*A licensed physical therapist may order or perform, with clinical justification diagnostic imaging which is within the recognized standard of the practice of physical therapy, including Magnetic Resonance Imaging (MRI).*"[76]

Determining if a PT is permitted to order imaging studies must include consideration that other state statutes or regulations may exclude a PT from ordering studies or restrict a radiation technician to accept an imaging order from a PT. At the time of the compilation of this document, there is action in several jurisdictions related to PTs performing diagnostic imaging, and requesting medical imaging within their scope of practice. In April 2016, Wisconsin Act 375 enacted into state law the legal authority for PTs to order radiography and for radiologic technologists to accept the orders as directed.[77] Legislative changes in other jurisdictions are being considered or have been proposed, constituting a dynamic environment of regulatory and administration circumstances. Even in regions where imaging is not specifically within the regulated scope of PT practice, education and training toward entry-level competency are nonetheless on-going. Physical therapists must be aware of the regulated

scope of practice in the jurisdiction of their professional activities prior to attempting to exercise any imaging privileges.

A review of all 50 states and the District of Columbia practice acts and rules was published in 2011.[78] A total of 21 states, plus the District of Columbia, have no mention of "radiology" or the terms "roentgen rays" or "radium" in their statutes (Appendix A: Table 1). While 29 state practice acts include language in their definition of physical therapy or limitation of authority sections with specific wording of restriction from imaging. The language is variable and specifically focused on restricting PTs from using radioactive materials for therapeutic or diagnostic purposes.[79] A further analysis of the 51 practice acts revealed that the standard language of "the use of roentgen rays and radium for diagnostic and therapeutic purposes" appears in only 16 practice acts. An additional 13 acts have language that is essentially restrictive with terminology such as, "shall not include radiology" (AL, AR, DE, ID, IL), "not include use of roentgen rays for any purpose" (NY, MS), only include restriction for therapeutic purpose (CO), "excludes the taking of radiologic studies" (NJ), and "excludes the taking of x-rays" (UT). One state (SC) has language that specifically restricts a PT from "ordering lab or other medical tests." Further, Colorado adds as grounds for disciplinary action the ordering or performing, *without clinical justification* (emphasis added), any service, x-ray, or treatment that is contrary to recognized standards of the practice of physical therapy as interpreted by the director.[76] In many instances, practice acts contain language that is not consistent with present education and practice.

Many state practice acts include language that requires a PT to refer to a physician specialist or other health care provider under certain circumstances. Twenty-nine states have

specific language requiring PTs to refer to other health care providers if the determination is made the symptoms or a condition require services beyond the scope of physical therapy or if physical therapy may be contraindicated, as with the case of a fracture (Appendix 1: Table 2). This can either be an affirmative statement as a duty to refer as a part of practice or listed under grounds for disciplinary action. The duty to refer includes referring for imaging if indicated. An example is a recent District of Columbia Board of Physical Therapy ruling. The regulatory interpretation was made that "*under section 17 DCMR § 6710.13 the Board believes that a physical therapist may refer a patient for diagnostic imaging to a health care provider who is qualified to perform such testing, provided the other conditions as set forth in the regulation are met.*"[74]

BENEFIT TO HEALTH CARE DELIVERY

Benefit to the Consumer

The individual consumer benefiting as a result of direct access to physical therapy has been clearly established with a rich body of evidence compiled for 4 decades from practice in the United States and around the world.[2,5,20,80-92] Resources that equip PTs to function more effectively as direct access providers would inherently add to these consumer benefits. The ability to facilitate more rapid patient management decisions through diagnostic procedures, if warranted, or to avoid them, if noncontributory, provides clear time and monetary benefits for the consumer.

Delays in the diagnostic process and the onset of patient care, specifically, the preferred course of care, has been cited by consumers as a key area of dissatisfaction with health care delivery.[93,94] The Institute of Medicine recently cited as a priority to improving health care the

need to make the diagnostic process more efficient by "*collaboration among …radiologists, other diagnosticians, and treating health care professionals to improve diagnostic testing processes*."[95]

Throughout this document, multiple examples of PT direct access care have been cited, which have allowed the consumer more rapid availability to the preferred course of care for musculoskeletal disorders. This experience for the consumer can be further enhanced by the availability of imaging privileges in PT practice, when indicated or contributory, for hastening the diagnostic process and establishing an evidence-guided course of rehabilitation or referral to a more suitable health care provider. Similarly, more rapid initiation of conservative care for conditions without indications for imaging also establishes the preferred course of care more rapidly, again benefitting the consumer.

Long-standing models of diagnosis and decision making have resulted in delays, dissatisfaction, and increased costs for the consumer.[93,94] The transition to more efficient modes of care delivery as proposed here are not novel, but rather based on well-established history, yet underutilized. As the need for innovation in health care accelerates, persisting with archaic systems will perpetuate the barriers, often the source of dissatisfaction and unnecessary expense for the consumer.

Currently, other first contact providers in the United States have the capacity to order imaging as part of their respective practices, including physicians, dentists, nurse practitioners, physician assistants, chiropractors, and certified nurse midwives.[96-100] The consumer in all jurisdictions of the United States has some form of direct access to physical therapy, resulting in improved availability of care in a timely and efficient manner.[73] For PTs to function as a more

complete provider within an evolving health care system in need of innovation, access to the resources to allow best patient management are essential. With PTs having the systematic support for diagnostic and procedural imaging, the potential exists to improve the health care experience for the consumer by more rapid initiation of an effective course of care with potential for cost and time savings.

Benefit to Society

The United States spent more than $3 trillion on health care in 2014. This equates to 17.5% of its gross domestic product and is an 8% increase over the last two years. Spending is projected to continue to grow an average of 6.1% per year until 2019.[101] The long-term viability of our current health care system is largely viewed as unsustainable.[102-104] In spite of the significant increase in health care spending, 1 in 5 Americans still experience delays in or denials of needed health care.[105] Potential solutions to this national dilemma have now shifted heavily towards value-based health care that aims to improve access to quality services while lowering costs and requiring greater accountability.[106] As this relates to diagnostic imaging, PTs are well-positioned to play an integral role in the value equation.

The value proposition has been described as having 5 essential components: (1) identification of best practices, (2) provider adoption of best practices, (3) measurement of provider performance, (4) cost effectiveness, and (5) policy development and implementation.[107] The data related to PTs and the use of diagnostic imaging is overwhelmingly positive as it relates to these 5 areas. Each area will be described below.

Identification of best practices, provider adoption of best practices and measurement of provider performance

Over-utilization of diagnostic imaging has long been recognized as a key driver contributing to rising health care costs.[20,104,108-111] Overutilization of diagnostic imaging has been exclusively attributed to nonphysical therapy providers thus far. Indeed, studies that have assessed ordering behaviors of PTs who have imaging privileges consistently show judicious use when compared to other health care providers.[5,19,20,22,112] As mentioned earlier, evidenced-based published guidelines such as the ACR Appropriateness Criteria are available to assist practitioners considering use of diagnostic imaging studies for their patients. Adherence to these guidelines and appropriate use of screening tools are designed to significantly reduce overutilization of diagnostic imaging and unnecessary patient exposure to ionizing radiation.[113-118] A recent study of PTs in the civilian sector who have privileges to order diagnostic imaging demonstrated close adherence to these guidelines.[22] Prudent use of imaging, as demonstrated historically by PTs, may reduce the harmful effects of early, unnecessary diagnostic imaging, which includes greater subsequent use of medical resources, increased health care expenditures, greater risk of work disability, and potentially poorer outcomes.[20,32,119-122] Similar circumstances exist with use of sonography. A recently published review specifically surmised that implementation of musculoskeletal sonography by nonphysician rehabilitation providers has the potential to be a critically advantageous addition to improve care.[66]

Cost effectiveness

That physical therapy as a first point of contact or with early intervention significantly reduces overall cost is well-established. [20,32,81,90,92] These cost savings are due, in part, to a reduction in ordering of unnecessary and noncontributory diagnostic imaging studies. The ability of PTs to

categorize patients effectively for intervention can, in many conditions, reduce or eliminate initial imaging for early decision making. This is readily demonstrated in the Virginia Mason Medical Center in Seattle, Washington study. During this investigation, a 40% reduction in the use of MRIs occurred during the study period when patients with uncomplicated low back pain were first seen by a PT.[20] The decreased utilization of diagnostic imaging for musculoskeletal disorders when patients have first care by a PT, coupled with the proven judicious use of imaging by PTs, who have ordering privileges, provide for a compelling case for widespread adoption of this value-based practice model.

Policy development and implementation

Perhaps the most challenging stage of the value proposition is policy development and implementation. Creating change throughout all entities of health care systems will likely be arduous. As an example, a direct access survey conducted by the APTA of over 1,700 PTs in direct access states revealed that existing institutional policies were seen as significant barriers to implementation of direct access privileges.[123] In regards to implementation of PT privileges for diagnostic imaging, two successful case studies have reported similar challenges related to policy development and implementation.[7,22] In both cases, navigating administrative barriers and updating hospital policy language were seen as critical and time-consuming steps toward successful implementation.

PROPOSAL FOR EXPANDED IMAGING UTILIZATION WITHIN THE SCOPE OF PHYSICAL THERAPIST PRACTICE

Physical therapist practice inclusive of imaging in patient management is well-established. Beyond simple historical precedent, an abundance of evidence has accumulated for more than 4 decades, demonstrating that PTs can utilize imaging appropriately.

Specifically, the evidence indicates PTs:

(1) are capable of recognizing the need for imaging in patients for optimal decision making and management upon initial patient contact as a necessary component of direct access, which exists to an extent in all jurisdictions in the United States;

(2) are capable of incorporating imaging results into initial and subsequent clinical reasoning processes in patient care toward more informed decision making on an on-going basis;

(3) can provide expert clinical examinations to determine whether imaging is necessary to drive the diagnostic process during patient care;

(4) are capable of utilizing imaging in a safe and efficient manner to reduce potential risks from exposure to ionizing radiation, to lower patient care costs, and to minimize the risk of iatrogenic sequelae of unnecessary early imaging in the course of a condition;

(5) have the capacity to supplement their clinical examination procedures with real time ultrasound imaging and to develop this capacity with certification under the auspices of an independent, multidisciplinary entity advocating the safe and effective use of ultrasound; and

(6) can utilize imaging to the benefit of the individual consumer without compromise to safety in patient-centered care and to society by efficient and economical use of medical resources.

In considering this cumulative evidence, the position of the Orthopaedic Section of the American Physical Therapy Association is:

(1) The legal authority within jurisdictions in the United States, as PT practice acts, are to be inclusive of PT practice having the capability to request/order diagnostic imaging toward optimizing patient management, and to have the authority to perform ultrasound imaging to optimize patient management.

(2) Institutional authorities and health care organizations should assimilate the evidence contained herein into their policies and alter their operational procedures to reflect change consistent with evolving legal authority of PT practice inclusive of imaging.

(3) Payers should recognize and interpret the cumulative evidence in support of PT practice inclusive of imaging as beneficial to all parties, particularly patients and payers. As such, payment mechanisms and procedures should be modified to be aligned with the evidence, along with statutory changes and organizational authorizations.

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Appendix A. Practice Act Language Regarding Imaging & Referral in Physical Therapy

Table 1. Practice Act Language Regarding Radiology[78]

Practice Act Language	States
Specifically included	WI[77]
Silent--No mention of radiology	AZ, DC, GA, HI, IA,IN, MD, MA, MI, MN, MO, MT, NV, NM, ND, OR, PA, RI, SD, TN, VT, WY
"Does not include the use of roentgen rays and radioactive materials for diagnosis and therapeutic purposes"	AK, CA, CT, FL, KS, KY, LA, NE, NH, OH, OK, SC, TX, VA, WA, WV
"Use of roentgen rays and radioactive materials for therapeutic purposes"	CO
"Physical therapy does not include the use of roentgen rays and radium for any purpose"	MS, NY
"Physical therapy does not include radiology"	AL, AR, DE, ID, IL
"…and may not use roentgen rays or radium"	ME
"Nothing in P.L…. shall be construed to authorize the taking of radiological studies"	NJ
"Physical therapy does not include the application of roentgen rays or radioactive materials"	NC
"Nothing in this chapter shall be construed to authorize a physical therapist to prescribe medications or order laboratory or other medical tests"	SC
"Physical therapy" or "physiotherapy" does not include (iv) taking x-rays"	UT

Table 2. Referral Practice Act Language[78]

Practice Act Language	States
DUTY TO REFER. A physical therapist shall refer a patient to an appropriate health care practitioner if the physical therapist has reasonable cause to believe that symptoms or conditions are present that require services beyond the scope of the practice of physical therapy. **GROUNDS FOR DISCIPLINARY ACTION.** Failure to refer a patient to the appropriate licensed health care practitioner when the services required by the patient are beyond the level of competence of the physical therapist or beyond the scope of physical therapy practice.	AK, AZ,CO,CT, DC, FL, GA, ID, IN, KS, LA, ME, MA, MN, NH, NJ, ND, NC, OH, OK, OR, RI, SC, TN,TX, VA, WA, WI, WY