

## THE MOVEMENT SYSTEM IN EDUCATION

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Although many physical therapists have begun to focus on movement and function in clinical practice, a significant number continue to focus on impairments or pathoanatomic models to direct interventions. This paradigm may be driven by the current models used to direct and guide curricula used for physical therapist education. The methods by which students are educated may contribute to a focus on independent systems, rather than viewing the body as a functional whole. Students who enter practice must be able to integrate information across multiple systems that affect a patient or client's movement and function. Such integration must be taught to students and it is the responsibility of those in physical therapist education to embrace and teach the next generation of students this identifying professional paradigm of the movement system. The purpose of this clinical commentary is to describe the current state of the movement system in physical therapy education, suggest strategies for enhancing movement system focus in entry level education, and envision the future of physical therapy education related to the movement system. Contributions by a student author offer depth and perspective to the ideas and suggestions presented.

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## INTRODUCTION

When the House of Delegates adopted the new vision statement for the American Physical Therapy Association in 2013, the profession of physical therapy in the United States began a path to change. This professional vision calls upon all physical therapists to utilize our unique body of knowledge, skills, and expertise to *transform society*.<sup>1</sup> At the core of this evolving journey is **The Movement System**- affecting all aspects of physical therapist practice. As defined, "The movement system represents the collection of systems (cardiovascular, pulmonary, endocrine, integumentary, nervous, and musculoskeletal) that interact to move the body or its component parts."<sup>2,3</sup>

Although many physical therapists have begun to focus on movement and function in clinical practice, a significant number continue to focus on impairments or pathoanatomic models to direct interventions without fully addressing the larger construct of the movement system (as defined). The methods by which students are educated may contribute to this "silo effect", a focus on independent systems, rather than viewing the body (across systems) as a functional whole. The education of the physical therapist includes the study of both typical and disordered movement at the biochemical (cellular), organ, and system levels. Students who enter practice must be able to integrate information across multiple systems that affect a patient or client's movement and function. Such integration must be taught to students and it is the responsibility of those in physical therapist education to embrace and teach the next generation of students this identifying professional paradigm of the movement system.

The purpose of this clinical commentary is to describe the current state of the movement system in physical therapist education, suggest strategies for enhancing movement system focus in entry level education, and envision the future of physical therapist education related to the movement system. Contributions by a student author offer depth and perspective to the ideas and suggestions presented.

## PAST AND PRESENT

Physical therapy curricula are constantly changing, adapting, and growing alongside the rapid changes that occur in the profession of physical therapy.

Education of physical therapists in the past was focused on technically based and skill-oriented instruction, strongly related to a biomedical model, and often responding to a provided medical diagnosis. As the profession has matured and physical therapists can provide a primary entry into health care, education has morphed and changed to include a strong focus on differential diagnosis (however, often pathoanatomically related), systems review, with an emphasis on critical thinking and high levels of clinical decision making. Students have been expected to combine aspects of their technical preparation, utilize the patient-client management model,<sup>4</sup> determine a diagnosis and prognosis, and arrive at functionally focused interventions that consider all aspects of the person.

An online assessment of some of the physical therapist educational curricula across the United States (as presented on each school's website, n = ~40) using the terms "movement", and "movement system", was used to explore and draw generalized conclusions regarding inclusion of the movement system by educational programs. Physical therapist educational curricula have great depth and diversity, and most include the assessment of human movement, functional activities, the introduction to movement-based diagnoses, and concepts associated with movement dysfunction, acquisition of movement, control of movement (motor control), and movement disorders. In some curricula, these concepts are linked to specific conditions or pathoanatomical diagnoses. However, in some curricula the focus is broader and more progressive, and includes a pathokinesiologic approach to analysis of functional movement, including movement system disorders and establishment of movement system diagnoses. It appears that education of physical therapists varies widely between curricula, and that the movement system is incorporated differently across programs from no inclusion, to some focusing on the movement system in a single course (often early in the curriculum), while others incorporate movement and the movement system throughout the curriculum. The most common place to include the movement system appears to be in examination and intervention courses. Suggestions for integration into courses and curricula will be provided by the APTA as they are developed.

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Varied success to date in widespread and consistent adoption of the movement system into DPT programs may be due to several reasons including but not limited to: lack of agreed upon the necessity for this change, resistance from traditionalists in education (chairs and veteran faculty),<sup>5</sup> and difficulty with logistics including the institutional demands related to and the time constraints of curricular change. It is important to acknowledge that movement system concepts, terminology, and exemplar practices are still being developed, which may also explain the lack of consistent inclusion in curricula. The presence of over 100 clinicians, educators, and researchers from across the country at the APTA Movement System Summit (held in December 2016) was a step toward moving movement systems based thinking forward. As information regarding the movement system continues to be developed and presented, educators need to respond appropriately, with open minds, and the profession's best interests at heart.

### **THE MOVEMENT SYSTEM: A CURRENT STUDENT'S PERSPECTIVE**

From a student's perspective, the process of attempting to retain all the material a physical therapy education has to offer, as well as attending to outside commitments (volunteer work, a leadership role) is difficult. The typical physical therapy student is quick to turn a shoulder to current professional topics, as long as they do not pertain to the next all too quickly approaching exam. One topic that all physical therapy students should be exposed to and embrace is that of the movement system. A common theme that makes students uneasy and frustrated is that identical pathoanatomical diagnoses are often treated with great variability, depending on the clinician. Physical therapy education programs could lead the way to greater clinical consistency by teaching students to choose interventions based on the entirety of the movement system and movement dysfunctions, in contrast with the arbitrary approaches utilized by many clinicians that appear to utilize the practice of "throwing widely used treatments" at a pathoanatomical diagnosis or simply selecting interventions that were emphasized in a particular education program.

When students are taught to choose and justify interventions based upon movement system diagnoses,

these interventions will have the same overarching goal(s), leading to greater homogeneity within the practice of physical therapy. For example, utilization of movement system diagnostic classifications as suggested for the shoulder complex in the paper by Ludewig et al would provide insight into greater consistency in interventions. Repeatedly observing and practicing interventions chosen with the goal of addressing movement system impairments will give students confidence and greater certainty in how to select both examination procedures and interventions for their patients and clients. Thus, the concept of the movement system should be on the "radar" of every physical therapy student, as it will improve patient care and provide peace of mind that interventions match a consistent standard of care across the profession.

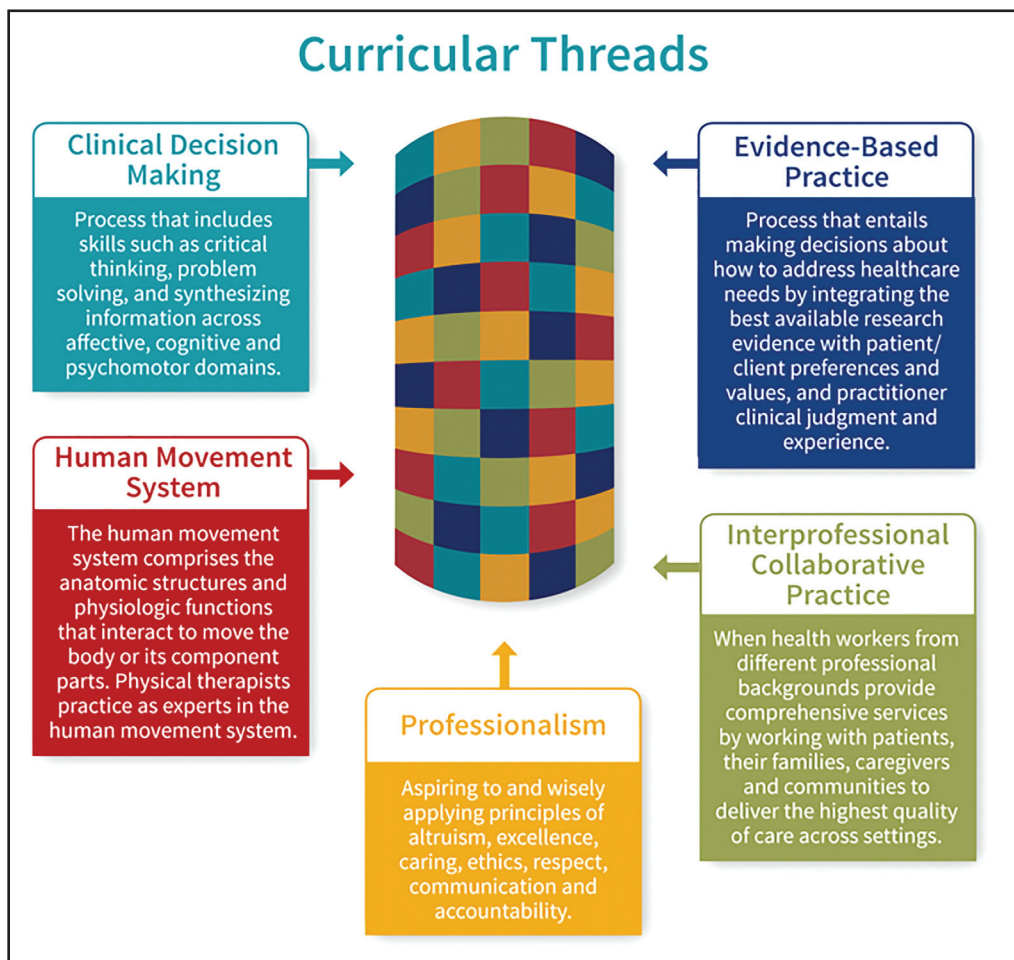
The many benefits of adopting the concept of the movement system are evident and the groundwork for the movement system has been laid, but physical therapy students possess the vital role of embracing and continuing to develop this concept as it is presented. As students enter practice, they must apply the movement system and not stumble into ruts of treating only one component of the movement system or treating with only the pathoanatomical diagnosis in mind.

### **FUTURE**

What does it mean to embrace the movement system in education? To foster change in practice, the education of students needs to adapt and to lead the way.<sup>5</sup> Ideally, the human movement system should be an integral part (Figure 1) of physical therapist education, alongside traditional components of curricula such as professionalism, clinical decision making, evidence-based practice, and interprofessional collaboration. Rather than dissecting practice into parts of the whole (e.g. classes in each area of practice), focus should remain on the "big picture" or how all areas of practice contribute to management of the movement system.<sup>6</sup>

### **SUGGESTIONS FOR ENHANCING MOVEMENT SYSTEM INTEGRATION INTO CURRICULA**

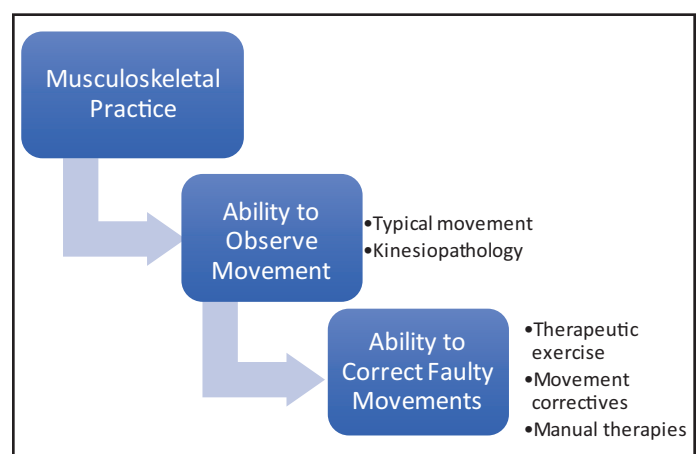
The introduction of the movement system concept should ideally occur upon entry into a physical therapist educational program. This could occur as part of an orientation to the educational program/



**Figure 1.** Example Curricular Threads Model (Used with Permission of MGH Institute of Health Professions, Department of Physical Therapy).

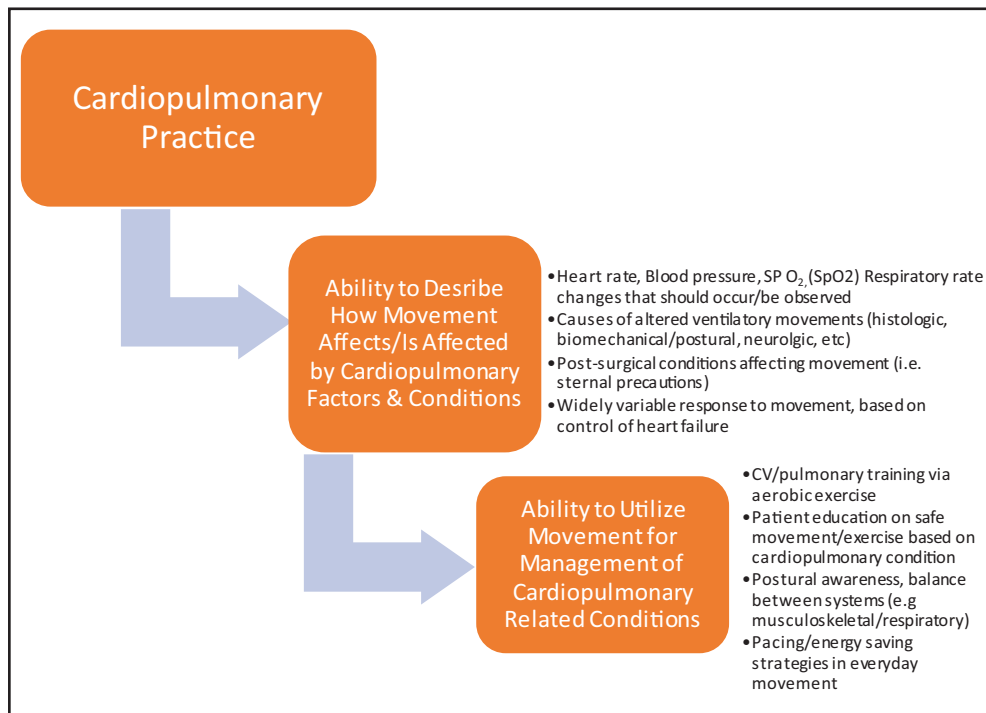
curriculum by defining the movement system as critical to the identity of the profession of physical therapy and thereby setting the tone for future inclusion. Clearly, a common identity requires common language and consistent use of accepted terminology.<sup>6</sup> Ideally, an initial professionalism or professional topics course would provide background on the APTA vision statement, the development of the definition of the movement system, and the trajectory of the evolving journey, addressing both where we are as a profession, and where we hope to go. Introduction of common language early in the curriculum is key.

The theme of the movement system should then be woven into all examination and intervention courses, across practice areas including but not limited to musculoskeletal, neuromuscular, cardiopulmonary, and integumentary, across the lifespan. Instruction in each practice area should include not only how to observe and diagnose movement

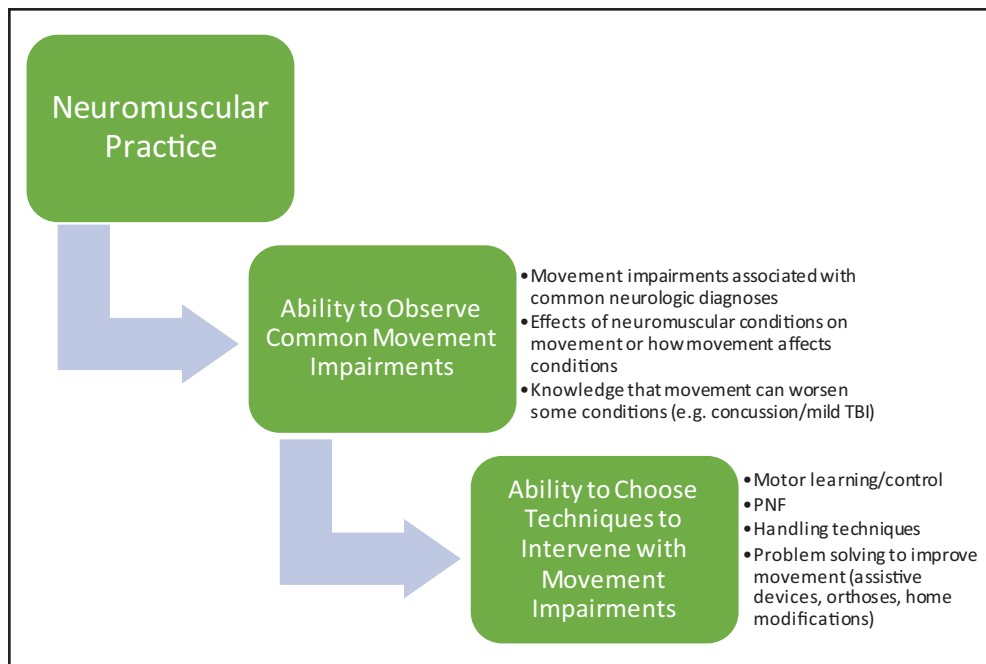


**Figure 2.** Movement System in Musculoskeletal Practice.

system impairments, but also methods to impact the movement system via skillfully directed interventions. Figures 2-5 present preliminary ideas of how movement observation and possible interventions



**Figure 3.** *The Movement System in Cardiopulmonary Practice.*



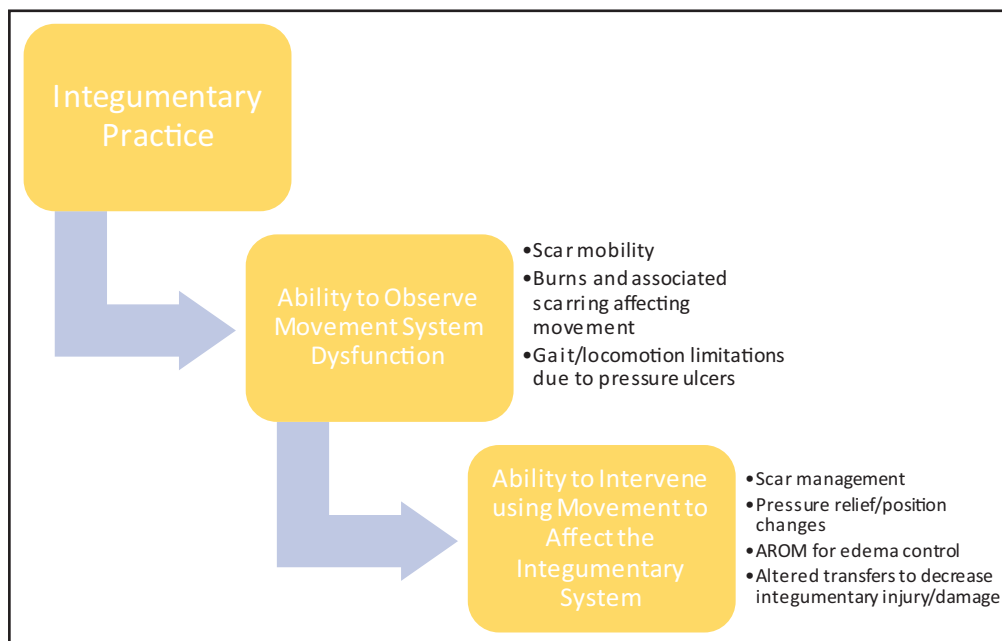
**Figure 4.** *The Movement System in Neuromuscular Practice.*

could be conceptualized in the four main areas of practice.

Integration courses, such as graduate seminars, colloquia, and critical thinking and clinical

decision-making courses should also emphasize the movement system and provide opportunities for discourse. If possible, there should be less “siloeing” of content into practice areas and more integration among/between content areas with examples of how





**Figure 5.** *Movement System in Integumentary Practice.*

a patient's movement is affected by and impacts all body systems. For example, integrating and highlighting how the cardiopulmonary system affects and supports rehabilitation of the musculoskeletal system would encourage greater integration.

The use of common terminology includes diagnostic labeling. In 2015, the HOD endorsed (HOD P06-15-25-24) the development of diagnostic labels and/or classification systems as a beginning step to inform clinical practice, education, and research.<sup>8</sup> Agreement upon the components of diagnostic labels was a main outcome goal of the Movement System Summit, however development of such labels and consensus building requires time. The report on the common features of diagnostic labels is forthcoming. Members of the Movement System Task Force and the staff of the APTA are diligently working toward this end. As diagnostic labels are proposed, examined, and written about in the literature, educators should respond appropriately and consider adoption of such labels.

Teaching students from the beginning of their professional education about movement examination and classification would ensure that the clinicians produced from educational curricula are competent and skilled in movement system diagnoses and movement dysfunction classifications.<sup>5</sup> Skills

that need to be emphasized in curricula include the observation of human movement, the knowledge of common movement system impairments across body regions and during functional activities (with diagnostic labels as they are developed), and a wide variety of evidence-based interventions that positively impact the movement system. Such evidence-based interventions are as of yet being researched and reported upon.

Finally, we should promote to current students that they be “ambassadors” of the movement system to not only other physical therapists (clinical instructors, colleagues, etc) within our profession, but also to those outside our profession including other health professionals and the public. Students must be taught to and be able to explain movement system principles to others so that the role and qualifications of physical therapists are well understood. The implementation of the movement system and identifying it as physical therapists' area of expertise gives current and future physical therapy students an influential and pivotal role in the direction and progression of the physical therapy profession.

## CONCLUSIONS

Overall, it will take time, commitment, and diligence on the part of physical therapy educators to accept

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and move forward with the movement system as the core of physical therapy education. This is essential to moving forward toward a unified profession, with a strong professional identity as experts in the movement system.<sup>9</sup>

To fully promote the movement system, it is anticipated that the professional entry-level curriculum will need to adapt to this new emphasis. At the very least, it is suggested that there be an introduction to movement system terminology and that the movement system is defined in an introductory course. This should be combined with an increased emphasis on movement system analysis as an integral part of the assessment process as well as the integration of complex multi-system movement system problems across the curriculum. Such practices will foster consistency in intervention, and encourage clinicians to consider the whole person from a movement system perspective. The intent of this commentary is not to be prescriptive, rather to share curricular models, ideas for implementation, and encourage best practices across all entry-level programs, in order to promote a dialogue within the physical therapist education community.

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