

Editorial

Back to Basics in Physical Therapy

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Much like the patients we care for, the field of physical therapy is a living, changing being. Recent advances in basic science research have challenged long-held beliefs about the methods of health care delivery. The result is significant interest in topics such as regenerative medicine, genomics, tissue engineering, and many others. It is critical that physical therapists follow this movement. Embracing a basic science approach will help us keep up with the changing landscape of health care and remain an integral part of the health care system.

The scope of physical therapy is broad. We work everywhere – from training rooms to the bedside – in school systems, outpatient centers, and even in the comfort of the patient’s own home. Despite the breadth of the profession, our common passion for enhancing individuals’ lives unites us. The American Physical Therapy Association provides our vision statement, “Transforming society by optimizing movement to improve the human experience” [1]. The APTA further defines regenerative rehabilitation as applying basic sciences concepts with the goal of maximizing tissue regeneration and repair and ultimately human function [2]. Simply put, basic science mechanisms are one of many avenues to take on our quest to achieve the APTA’s vision.

The regenerative capacity of a variety of tissues is currently being studied. For example, introduction of extracellular matrix, stem cells, platelets and other biologic materials have the potential to improve one’s health and function through cellular mechanisms [3]. As part of the recovery course, our role as physical therapists is to support these regenerative processes through facilitating appropriate and safe movement.

Mechanotransduction describes the process by which a mechanical stimulus is transmitted to the cellular level resulting in a change in cell activity [4]. This concept demonstrates how physical therapy interventions successfully aid in tissue healing [5]. Common stimuli include tension, compression, shear, hydrostatic pressure, vibration, and fluid shear.

In a practical sense, these stimuli can be applied through a variety of interventions. Manual therapies such as soft tissue or joint mobilization and manipulation and therapeutic exercise in the form of strengthening are common treatments that create mechanical stress. In addition, paraffin, aquatic therapy, and pneumatic compression are frequently used modalities with similar capacities.

Many applications of this basic science concept are evident in daily practice. They range from principles as common as Wolff’s Law regarding bone adaptation to stress to more recently proposed mechanisms of tendon response to loading [6,7]. Processes have been described for muscle and particular cartilage as well.

Whether we realize it or not, basic science principles are evident in physical therapy practice. Of course, many other factors are involved in rehabilitation, however the purpose of this article is to bring to light the various concepts in regenerative rehabilitation and challenge physical therapists to appreciate its presence. Gone are the days when unsubstantiated claims are acceptable to the scientific community or serve as justification for trendy, idiosyncratic, or even dangerous treatment approaches. Our careers demand more respect and our patients certainly deserve it. The dynamic nature of the physical therapy profession necessitates a thorough understanding of basic science principles. Further research into basic science principles and widespread dissemination of journal findings is essential for continually improving clinical practice and working toward the APTA vision.

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