

Functional Pathology of the Musculoskeletal System:

Volume One—Introduction

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Leonardo da Vinci’s “Vitruvian Man” drawing is one of the most recognized images in the world. It is often used in association with health care and fitness communications. For many people, it conveys a sense of the ideal structure and balanced movement of the human being. Da Vinci drew it early in his intellectual and artistic development in an effort to capture numerous metaphysical ideas prominent in antiquity about the universe as macrocosm reflecting man as microcosm. However, it does not well represent his increasingly scientific, mature thought (Lester, 2012; Lopez, 2012).

Given its wide recognition, I chose da Vinci’s “Vitruvian Man” as a starting point for my image of the “Proportionate Man” on the cover of *A Treatise on the Functional Pathology of the Musculoskeletal System*. As detailed in this Treatise, my adaptations of da Vinci’s Vitruvian Man reflect more accurate and complete depictions of human movement . . .

Additionally, as detailed in this Treatise, my “Proportionate Man” adaptation of da Vinci’s image illustrates the operational criterion for discerning balanced (proportionate, not merely symmetrical) motion for each unique individual on a three-dimensional, whole musculoskeletal system basis, as well as the myriad ways in which balance may be compromised.

www.wjbrooksdo.com/author to read the entire Foreword by David Griesemer, MD
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This Preface presents the developmental history of this four-volume treatise on the functional pathology of the musculoskeletal system (ie, this Treatise), in the course of which numerous major contributing individuals are acknowledged.

Summary

Years of clinical experience facilitating resolution of many chronic, complex, multiregional, nonspecific pain syndromes from “head to toe and everything in between” have convinced me and my protégés that no substitute exists for understanding and evaluating the entire MSS to adequately address any given region of pain. Additionally, as will become clear throughout this book, the central question organizing the FPMSS compels it. Using the FPMSS paradigm, I have also contributed to the successful care of patients with a variety of other clinical conditions, including persistent postconcussion syndrome, spinal deformity, a wide variety of developmental delays, and some congestive and/or dysautonomic disorders of the respiratory and gastrointestinal tracts. I sincerely hope that the reader will find within these volumes the conceptual and diagnostic tools to distinctly improve his or her care of patients suffering from these vexing syndromes—as, I believe, they pivotally have for my patients.

This overview presents the motivations and goals for, along with the broad content of, this four-volume Treatise on the Functional Pathology of the Musculoskeletal System. It offers comparisons of “restorative care” vs “maintenance care” and introduces my definitions of science and the terminology of scientific adjudication. The intended audience is identified.

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Summary

Application of the FPMSS paradigm will significantly improve clinical efficacy and professional satisfaction as well as advance research and education in physical medicine. It portends much greater success in caring for patients with both musculoskeletal pain syndromes (including headache) and other medical conditions influenced by musculoskeletal and autonomic nervous system behavior. Decreasing a vast array of adverse consequences of chronic pain—personal, social, economic, and medical, including the risks of “drugs, needles, and knives,” along with propensity to other diseases such as obesity and the myriad possible results thereof—will be of incalculable benefit. Examination of the FPMSS is a worthy aspect of the foundational training of all physicians and practitioners of musculoskeletal health care.

Chapter 2: Conceptual Foundations

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Two concepts foundational to the Functional Pathology of the Musculoskeletal System paradigm are introduced in this chapter and developed further in Volume Two: (1) discriminating structural from functional pathology in general and (2) understanding the musculoskeletal system as an integrated organ system.

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Summary

Structural pathology is a defect of mass (substance) and/or geometry (shape). Functional pathology is a disturbance of relationships between structures (ie, the orchestration of the structures) expressed as behavior. It is possible to meaningfully view the musculoskeletal structures as belonging to an integrated organ system. This chapter has introduced two conceptual foundations for the FPMSS paradigm. Chapter Three introduces principles of nomenclature and a foundational lexicon for understanding and evaluating the function and malfunction of the MSS when viewed as an integrated organ system. Chapters Four through Six then build more specific understandings of function and malfunction with additions to the lexicon as necessary. Chapters Seven and Eight offer the requisite practical tools, including principles of clinical evaluation along with a standardized examination apropos to a primary care practitioner, to objectively measure FPMSS. Chapter Nine introduces principles of clinical application of those tools. Chapter Ten discusses various medical system imperatives consequent to validation of this paradigm. Chapter Eleven completes this volume with a prelude to the advanced volumes.

This chapter introduces principles of a scientifically content valid nomenclature for understanding musculoskeletal structures as an integrated organ system. The rationale for the proposed lexicon of the Functional Pathology of the Musculoskeletal System paradigm includes those principles as well as the experiences and arguments offered in chapters to follow. Further supportive arguments are offered in Volume Three.

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Summary

This chapter initiates discussion of the principles of a scientifically content valid nomenclature for understanding musculoskeletal structures as an integrated organ system. It introduces the lexicon of the FPMSS paradigm prerequisite to the discovery exercises in Chapter Five and the introductory examination offered in Chapter Eight.

This Treatise puts forth a framework for and initiates a description of the necessary and sufficient content for a science of human movement and posture. Internally consistent principles of and further nomenclature for function of musculoskeletal system structures when considered as an integrated organ system are introduced in this chapter. These topics are discussed in more breadth and depth in Volume Two.

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Summary

This chapter outlines the necessary and sufficient content for the science of human movement and posture. Internally consistent principles of and nomenclature for the function of musculoskeletal system structures when considered as an integrated organ system are introduced in this chapter. Definitions of and discriminations between plastic versus elastic range of motion and between active and passive range of motion are provided. The subcategories of passive range of motion are detailed. The concept of the kinematic chain as an aspect of the kinetic chain is introduced. Additional discussion of posture includes discrimination of morphology from posture.

Chapter 5: Discovery Exercises **81**

This chapter offers simple exercises leading to the discovery of basic principles for construct valid examination of musculoskeletal system dysfunction.

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Summary

The additional range of motion beyond the active physiologic barrier is not uniformly proportionately small at all joints and plays an important role in optimal function. The elastic range provides for storage and release of (elastic) energy, including all PPROMs, and variably participates within different APROM and accessory ranges. Examining how much motion is available must include PSLROM, not merely APROM, tests through the full potential range of motion, including through all elastic ranges, whether APROM, PPROM, or accessory motion ranges. Active motion testing and PSLROM testing address fundamentally different questions. Active motion testing addresses how motion is controlled or orchestrated. PSLROM addresses how much motion is available.

The MSS is a mechanically linked system. Therefore, to confidently state what motion is available, the examiner must specify the joint(s) at which motion is intended; when a specified motion occurs at multiple joints, the direction plus sequence of linkage; the configuration(s) of the moved segment(s); and the general and specific postural context.

Chapter 6: Dysfunction

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This Treatise puts forth a framework for and initiates a description of the necessary and sufficient content for a science of human movement and posture. Internally consistent principles of and language for malfunction of musculoskeletal system structures when considered as an integrated organ system are introduced in this chapter. These topics are discussed in more breadth and depth in Volume Two.

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Summary

This chapter identifies the practical central organizing question of FPMSS: “How efficiently does the MSS create posture and movement?” Valid definitions of barriers to motion are described. The adverse clinical consequences of invalid barrier concepts are emphasized. Proportionality is the requisite criterion for the necessary stages of interpretation to determine the inefficiency of available and active movement as well as posture. The three stages—grading, prioritizing, and profiling—of interpretation required for clinical application of within-system analysis are presented in Chapter Seven.

Chapter 7: Principles of Interpretation of Available Motion **109**

This chapter describes the gathering of and interpretive process for within-system analysis of available musculoskeletal system motion.

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Summary

The examination for FPMSS must be comprehensive and potentially exhaustive. It need not be exhaustive for every clinical purpose. The three stages of interpretation for FPMSS evaluation of available motion—grading, prioritizing, and profiling—are described. The schema for grading available motion is presented as a prerequisite for documentation of examination findings as well as for prioritizing and profiling.

In Chapter Eight, an examination is offered that employs and further illustrates FPMSS paradigm principles, definitions, and conventions. In Chapter Nine, principles of clinical application of examination findings as well as a hypothetical case are presented. Employing the interpretive steps offered in this chapter for directing mobilizing interventions will frequently yield significant clinical value not otherwise obtained by traditional methods of evaluation.

Chapter 8: Introductory (Primary Care) Examination

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This chapter details a comprehensive, but not exhaustive, examination for available motion of the musculoskeletal system appropriate for use in a primary care practice. Numerous additional construct valid tests—based upon principles of the Functional Pathology of the Musculoskeletal System paradigm—are offered in Volume Four.

Diagnostic tests are categorized by the whole musculoskeletal system general postural contexts and then subcategorized into appendicular and axial skeletons, each of which has progressive subdivisions, as required.

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Summary

This chapter details a comprehensive, but not exhaustive, examination for available motion of the musculoskeletal system appropriate for use in a primary care practice. Numerous additional valid tests are not included. The lists of tests are divided by broad postural contexts subdivided into appendicular and axial skeletons, each of which have progressive subdivisions as required. The most common patterns of linkage and, thus, potential compensation, are assumed in the descriptions. The examiner must be ever mindful of possible atypical patterns of linkage.

This chapter includes an initial discussion of the complete restorative care process and a hypothetical case that reflects my common experience in restoring proportionate available motion over the course of several encounters for a patient with chronic “nonspecific” cervical and lumbar pain that had been responsive—but only partially and temporarily—to other forms of physical medicine directed to the symptomatic regions.

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This chapter initiates discussion of the complete restorative care process, which is further detailed in Volume Four. By prioritizing the most severely dysfunctional diaphragms and beginning treatment of the most severely dysfunctional diaphragms most remote from the location of symptoms, clinicians can achieve relative rest of the symptomatic structures as the first step toward the final goal of patient self-care. Profiling refines the clinician’s understanding of what is proportionate available motion for each unique patient. A hypothetical case of a patient with recurrent and then persistent cervicgia and lumbalgia is presented.

This chapter puts forth the rationale for the professional imperatives of the Functional Pathology of the Musculoskeletal System paradigm and manual medicine (specifically osteopathic manipulative medicine) with case examples in medical necessity and physician-based practice.

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Summary

The rationale is presented for the professional imperatives for evaluation of FPMSS and performance of manual medicine. First, medical necessity as distorted control of posture and movement is difficult to self-diagnose and treat, pain inhibition may overwhelm a patient otherwise highly motivated to self-care, and accessory motion range restrictions cannot be self-diagnosed or self-treated. Second, physician-based practice as the process of evaluation and care of FPMSS has significant impact on the diagnostic process involving the whole person and vice versa. Reclassification of somatic dysfunction to 30 categories in subsequent versions of the ICD/CPT is emphatically urged. Relabeling OMM/OMT as “osteopathic mobilizing medicine” and “osteopathic mobilization treatment” to better reflect traditional osteopathic as well as FPMSS paradigm diagnostic and therapeutic efforts is also recommended.

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