THE INSTITUTE FOR FUNCTIONAL MEDICINE®

Functional Medicine: A Clinical Model to Address Chronic Disease and Promote Well-Being

What Is Functional Medicine?

Functional medicine asks how and why illness occurs and restores health by addressing the root causes of disease for each individual. It is an approach to patient care that views health and illness as part of a continuum in which all components of the human biological system interact dynamically with the environment, producing patterns and effects that change over time. **Functional medicine may be described as the clinical application of systems biology.** Chronic disease is usually preceded by a period of declining function in one or more of the body's systems. Restoration of health requires improving the specific dysfunctions that have contributed to the disease state. Functional medicine provides tools and a reproducible method to enable clinicians to identify dysfunction and promote balance in physiology as the primary means of improving patient health.

Human biology is far more complex than the human genome. In fact, most diseases are not genetically determined. It is gene expression rather than genetic inheritance that is essential in the emergence of disease. Gene expression is altered by myriad influences, including environment, lifestyle, diet, activity patterns, psycho-social-spiritual factors, and stress. Diet and lifestyle choices and environmental exposures can render disease more or less likely by turning on—or off—certain genes. **Functional medicine directly addresses modulators of gene expression, an individual's environment, and other underlying causes of disease through a systems-oriented approach.** The functional medicine clinical model provides practitioners with the method and the means to thoroughly evaluate the myriad interactions among genetic, environmental, diet, and lifestyle factors that influence health and may manifest as complex chronic disease.

Functional medicine recognizes that a patient's "environment" is not limited to physical and biochemical exposures, but also to societal conditions and the "human interactome." As the field of health care becomes more aware of the impacts of social determinants of health, as well as discrimination writ large, functional medicine practitioners must be willing to explore their own unconscious/implicit biases and be willing to explore a patient's history of trauma from injustices and prejudice of any kind, and to authentically ask patients what they want them to know about their personal stories. Such an approach is capable of improving the therapeutic partnership between patient and clinician, allowing the patient's experiences to favorably influence the therapeutic plan and improving health outcomes.

The functional medicine clinical model enables practitioners to obtain and incorporate clinical information that leads to individualized, patient-centered interventions. **Functional medicine concepts, practices, and tools have necessarily evolved over the past 30 years and will continue to do so.** *This reflects the dramatic growth in the evidence base identifying potential root causes of disease: the primacy of lifestyle factors such as diet, stress, sleep, and physical activity as well as the role of the environmental exposome, including infections, allergens, and toxins.* Personalization of the therapeutic approach is informed by the 'OMICS' revolution, considering the gene-environment phenotype through the expression of proteomics, metabolomics, and metagenomics.

The knowledge base of functional medicine is informed by these core processes:

- **Gene-Environment Interaction:** Functional medicine is based on understanding the metabolic processes of each individual at the cellular level. By recognizing how each person's genes and environment interact to create their unique biochemical phenotype, it is possible to design targeted interventions that modulate gene expression and 'move upstream' to correct physiological dysfunction.
- **Upstream Signal Modulation:** Functional medicine interventions modulate "upstream" dysregulated processes that result in the accumulation of damaging end products rather than blocking the "downstream" effects of these damaging processes. The critical importance of inflammation provides an important use case. The role of *inflammaging* has been demonstrated across numerous diseases.[1,2,3] Rather than using drugs that block inflammation (NSAIDs, immunosuppressants, biologics, etc.), functional medicine uses systems-based approaches addressing lifestyle, nutritional imbalances, and other inflammatory contributors to downregulate inflammation closer to the source.
- **Systems Biology–Based Approach:** Functional medicine uses systems biology to understand and identify how core imbalances in biological systems can manifest in other parts of the body. Rather than an organ-based approach, functional medicine utilizes a ***Matrix*** model (see below) to address core physiological processes that cross anatomical boundaries. This approach provides the basis for the design of effective multimodal treatment strategies.
- **Multimodal Treatment Plans:** The functional medicine approach uses a broad range of interventions in concert to achieve optimal health, including diet & nutrition, exercise & movement, stress management, sleep & rest, and targeted nutraceutical & pharmaceutical therapies. These interventions are tailored to address the antecedents, triggers, and mediators of disease and dysfunction in each individual patient.
- **Understanding the Patient in Context:** Functional medicine uses a structured interview process to discover each patient's history in order to gain an understanding of the individual's story within the context of the antecedents, triggers, and mediators. Examples of these include social determinants of health, social needs of health, and injustices experienced such as bias and prejudice, respectively. Functional medicine tools (including the ***Timeline*** and the ***Matrix*** model) are integral to organizing clinical data and promoting clinical insights. This approach ensures that the patient is heard, the therapeutic relationship is fostered, therapeutic options are expanded, and patient activation is improved.
- **Patient-Centered and Directed:** Functional medicine practitioners endeavor to mitigate their own implicit biases in order to work with the patient to find the most appropriate and acceptable treatment plan to optimize the fundamental underlying issues in the realms of mind, body, and spirit. Patients are welcomed into the process of exploring their story to engage in the diagnostic process, set achievable health goals, and design an appropriate therapeutic approach.

Functional Imbalances: Form Follows Function, Function Follows Environment

The functional medicine ***Matrix*** *(see Figure 1)* is a tool that organizes and integrates the biological systems in which core clinical imbalances reside. This helps translate the rich basic scientific literature concerning physiological mechanisms of disease into the clinical studies, clinical diagnoses, and clinical experience acquired during medical training. These core functional imbalances serve to bridge the mechanisms of illness with the clinical manifestations (and diagnoses) of disease:

- **Assimilation:** Digestion, absorption, microbiota/GI, respiration
- **Defense and Repair:** Immune, inflammation, infection/microbiota
- **Energy:** Energy regulation, mitochondrial function
- **Biotransformation and Elimination:** Detoxification
- **Transport:** Cardiovascular and lymphatic movement
- **Communication:** Endocrine, neurotransmitters, immune messengers
- **Structural Integrity:** Subcellular membranes to musculoskeletal integrity

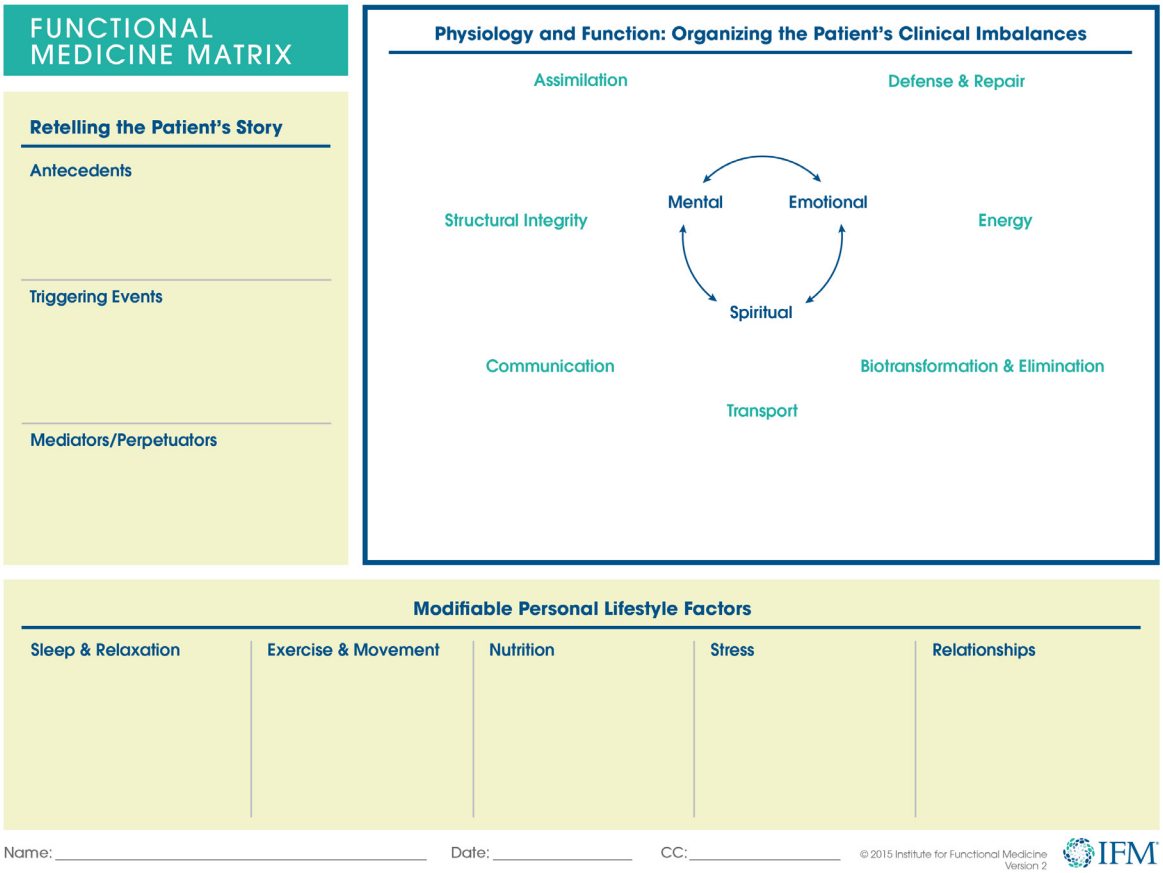
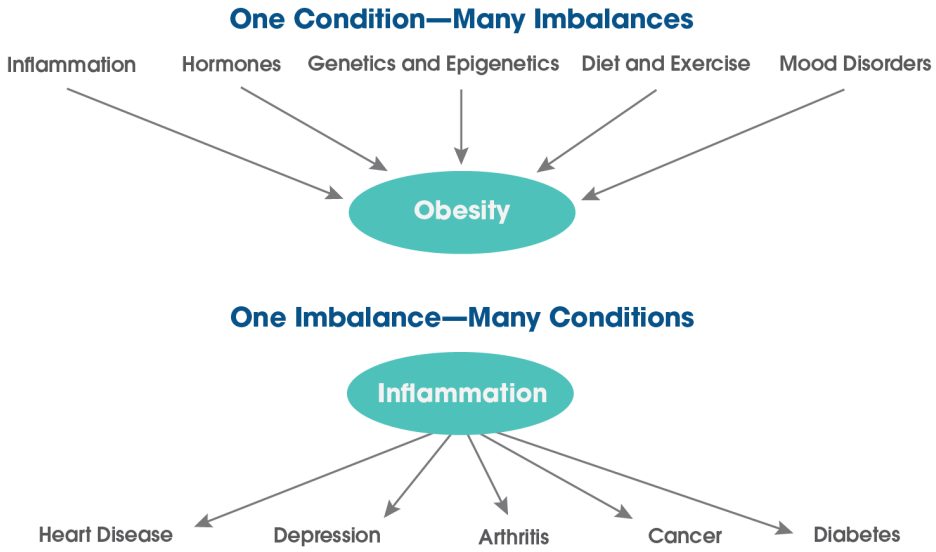


Figure 1. *The Functional Medicine Matrix*

Using this construct, it is possible to see that one disease/condition (e.g., obesity) may have multiple causes, just as one fundamental imbalance (e.g., inflammation) may be at the root of many seemingly disparate conditions *(see Figure 2)*.



The most important precept of functional medicine is that restoring balance between a patient's environment and their physiology is the key to restoring health. It is also the case that by addressing any fundamental imbalance, the functional medicine model potentially postpones or prevents the future emergence of multiple other conditions.

Constructing the Model – Putting It Into Practice

The Institute for Functional Medicine (IFM) has developed concepts, methods, and tools that help to collect, organize, and gain insight from the expanded history, physical exam, and laboratory evaluation *(see Figure 2)*. From this informational architecture emerges a comprehensive dashboard of the patient's story that helps to visualize the most important clinical elements of functional medicine:

1. A focus on the patient's narrative story in order to understand, connect, and empathize. Note that the centrality of the patient's mind, spirit, and emotions, with which all other elements interact, is emphasized by its location at the heart of the clinical imbalances.
2. Creation of an optimal healing environment that deepens the therapeutic relationship.
3. Identification of the factors (antecedents, triggers, and mediators) in the patient's lifestyle and environment that influence the expression of health or disease, including experiences of bias and social determinants of health.
4. Use of the ***Timeline*** *(see Figure 3)* and ***Matrix*** tools to map imbalances and key events. These illuminate potential root causes of illness and uncover a pattern of dysfunction.
5. Integration of this information to create a comprehensive perspective on the origins and influences that have contributed to the patient's problems, including experiences of bias and social determinants of health. The process of critical analysis and synthesis leads the clinician to arrive at recommendations personalized for each patient that help reverse the disease process and improve health.

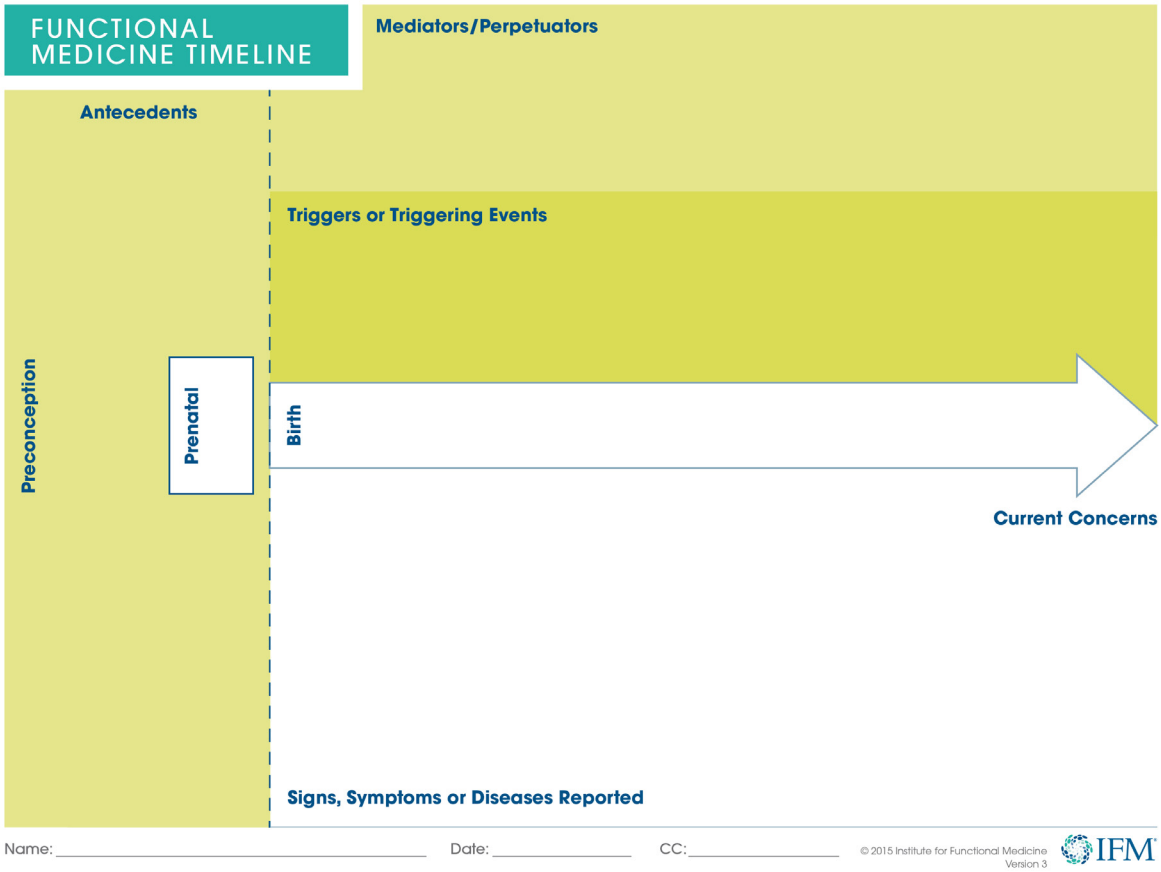


Figure 3. *The Functional Medicine Timeline*

The Functional Medicine Treatment Plan

A functional medicine treatment plan may involve one or more of a broad range of therapeutic modalities, including many different dietary interventions, along with lifestyle changes and nutraceuticals. A 'Food First' approach emphasizing nutrition is essential to the practice of functional medicine.

Scientific support for the modifiable lifestyle factors embedded in the functional medicine approach is found in the extensive and rapidly expanding evidence base supporting the therapeutic effects of nutrition, exercise & movement, sleep, and stress management.

As we consider physiology and pathophysiology from a systems-biology perspective, we assess and treat the inter-related functions of metabolism, biotransformation, energy production, immune modulation, and hormonal regulation. Treatment approaches incorporate other integrative modalities demonstrated to be of benefit in the peer-reviewed clinical literature, including acupuncture, botanical medicine, manual medicine, and mind/body therapies.

In addition, case studies, [4,5,6,7,8] and larger trials utilizing Patient-Reported Outcomes Measures, [9,10] have expanded the research database supporting functional medicine. These studies and the development of a practice-based research network will help demonstrate the effective application of "real world medicine," which includes the clinical relevance of multimodal approaches to complex, chronic disease as seen in the seminal FINGER study on prevention of dementia. [11]

This clinical approach occurs within the context of a collaborative relationship between the practitioner and patient that is free of implicit bias. The practitioner respects the patient's role and knowledge of self and activates the patient to engage in the recommended interventions. Clinical experience and published evidence indicate that the elements of behavior change are equal to or more important than ordering the correct diagnostic tests and recommending individualized therapies. Functional medicine inherently embraces a team-based approach to assess a patient's readiness to change and provides the necessary guidance, training, and support.

Summary

› **The practice of functional medicine involves five essential components:**

1. Eliciting the **patient's complete story** during the functional medicine intake that attends to social determinants of health.
2. Establishing a mutually **empowering partnership** between practitioner and patient that is free of bias.
3. Identifying and addressing the challenges of the patient's **modifiable lifestyle factors** and environmental exposures.
4. Organizing the patient's clinical imbalances and underlying causes of disease in a **systems biology matrix** framework.
5. Providing **personalized recommendations** to guide the patient on their journey to improved health and wellness.

The signature strength of functional medicine is its unified model that can be applied across a wide variety of health professions to facilitate integrated care. Functional medicine plays a key role in the effort to address the modern epidemic of chronic disease, the recurring threat of pandemics, and the ever-present need to foster health and well-being. Using these concepts and tools, functional medicine practitioners contribute vital skills for addressing and reversing the global health issues of the 21st century.

While reasonable efforts are made to provide a translation, no liability and no responsibility are assumed by IFM for any errors, omissions, or ambiguities in the translations or other information provided by the translation of this descriptive paper.

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