Medical Practice and Complexity Thinking in Primary Care

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This historical narrative review describes the development of general/family practice in relation to complex adaptive systems theories. Although both disciplines emerged in parallel, it took general/family practice 30 to 40 years to start engaging with systems and complexity sciences as a means to better understand the nature of health and illness in general and its implications for primary care in particular.

Complex systems theories provide an initial framework for a *generalist understanding* of health, illness, and disease as interconnected and context-dependent states of human experience. Viewed from this perspective, the task of the clinical consultation broadens from simple identification of a specific condition toward an untangling of the circumstances and the patient's understandings of particular illness episodes, before exploring how to best improve or maintain health.

Complexity Thinking Enters Primary Care

The past 15 years have seen an expansion of systems and complexity thinking in primary care, exploring practice organization and organizational learning, the nature of health, illness, and disease; the nature of clinical practice; and the behavior of illnesses in particular patients and patient groups.

There is an increasing awareness of the importance of network relationships, initial conditions, self-organization, and emergence as the background to understanding a patient's problem or a practice's performance. Recognizing the *complex adaptive nature* of health, illness, and care has broadened our understanding of patients' health care needs, and made it possible to describe system constraints and unintended consequences of system interventions on meeting those needs.

General/family practice researchers and academics have both explicitly and implicitly framed the emerging discipline in systems and complexity sciences terms. There has been a scholarly recognition of the importance of dynamics, context, agency, attractors, and interdependences in patient care, education, and health care organization. These insights have influenced the *philosophical discourses* of the discipline, contributing to the growth of its unique identity and its relationships with the broader health care system.

Not Just Reductionism: Treating the Whole Person Philosophically

Systems and *complexity thinking* was embraced as a transformational tool to link the specific with the particular of whole-person care—the patient as a subsystem of larger systems such as family, community, society, and the health care system. Not surprisingly, this approach resonates well with general and family practitioners as it much more accurately describes the high degree of variability they encounter among patients presenting with the same condition.

Systems and complexity sciences provide valuable research frameworks that allow researchers to make sense of the dynamic phenomena observed in primary care. Recent empirical research has provided findings that indicate the value of understanding the behaviors of many common conditions as *complex phenomena*, for example, psychiatric illness, intimate partner violence, cardiac and respiratory diseases, aging, and avoidable hospitalization.

Metaphors remain important, powerful, and valid means for understanding complex phenomena in and generating new knowledge for primary care. The challenge for the future, alluded to by critical voices, is to progress from well-established conceptual and philosophical models to the pragmatic application of *nonlinear dynamics* and modeling.

Access to “big data” is required for dynamic systems modeling, especially of linked subsystems, as each has its own dynamics but is also affected by cross-system dynamics. This work can be applied to patient care, practice organization, and community development, and to influencing health care reform. Such empirical work needs to be published more consistently in general/family practice journals.