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Improving the medical home through an understanding of complex systems



The Medical Home

The American Academy of Family Physicians (AAFP) published the Joint Principles of the Patient-Centred Medical Home (PCMH) in March of 2007. These principles include care of the whole patient from life's beginning to end by a physician-led team at one location coordinating all patient care. Comprehensive quality and safety shall be achieved through careful application of modern information technology. Patients shall have enhanced access to care through open access scheduling, expanded office hours to accommodate patients' life schedules, and new electronic communication and education through electronic mail and peer reviewed Internet resources [1].

While these PCMH goals dressed up with modern information technology appear au courant, the goal of the truly patient-centered medical homes has been a goal of the true family doctor since before the birth of the AAFP itself [2]. While politico-economic exigencies may require the AAFP to redefine the Family Medicine model of healing in support of George Engel's BioPsychoSocial model of health [3], the questions this actually raises may be the following – after more than 40 years, why must we argue for it? Why must we still explain it? Why does the successful medical home not already exist?

Complex systems

Studying complexity in human physiology, human society and, for our purposes, health care systems aids the answer of this question. Medical homes do exist, and this paper will conclude with a case study of one, but these successes are rare. Some of the complex systems principles which may illuminate the challenge are the following.

Health is complex [4] and physicians miss the mark. The simple traditional bio-medical model of health care leaves human beings un-

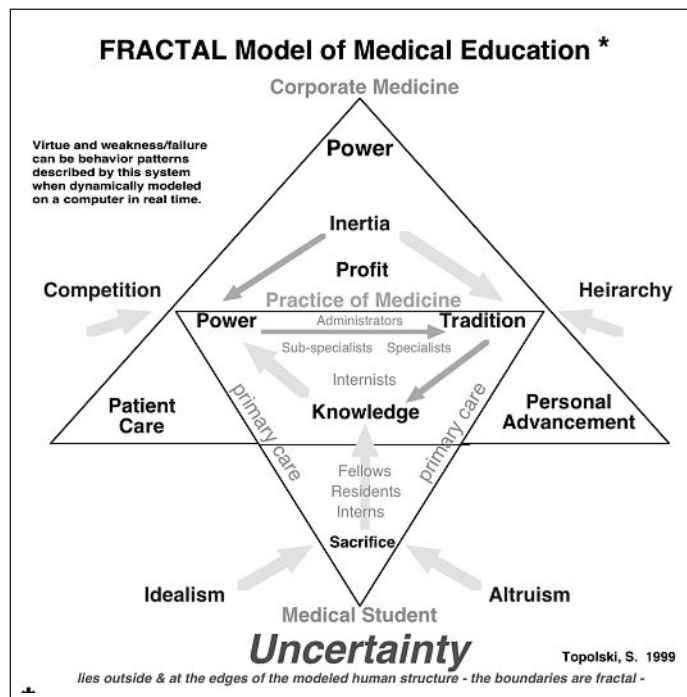


Figure 2
Complex Systems Model of Physician-Driving Forces.

satisfied and unhappy. The World Health Organization definition of health is impractical, outdated and in need of better theoretical foundation. Complex systems would define bio-psycho-social health more carefully as an interactive tensor of co-dependent internal and external factors of health, that is more holistic, accurate and potentially measurable (fig. 1).

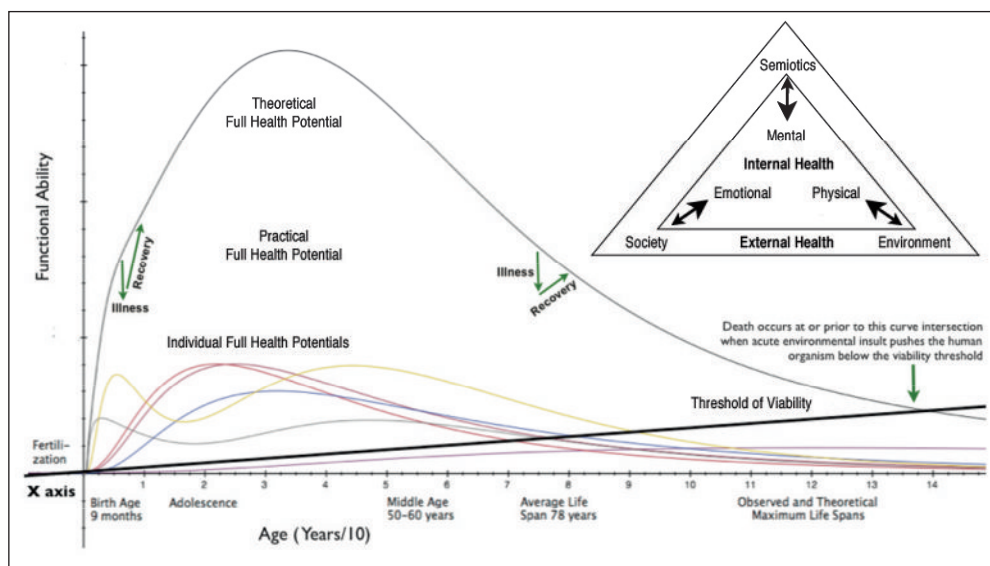


Figure 1
Complex Systems Model of Health and Illness.

The core driver of physician (health care actor) behaviour is not commonly recognized. Physician behaviour is driven more by monetary reward than the call to service [5]. From a complex systems perspective, qualitative factor analysis can identify the core drivers or strange attractors of our health care system as monetary and social power before service. When physicians and other health care actors recognize this, we will have taken our first step to removing obstacles to the ideal patient-centred, non-profit-centred, medical home (fig. 2).

Successful complex systems require tremendous amounts of information feedback [6]. Continuous, immediate, accurate feedback is essential to quality patient care but terribly lacking in dysfunctional health care systems. Reducing turbulence in information flow is equally important. Careful design of practice architecture – work flow, office shape, and sustainable use of appropriate information technology – improves information flow and reduces turbulence, maintains flexibility, and improves responsiveness, robustness and overall quality of care [19].

Finally, powerful outside forces push physicians away from health care. In a world where human health is hard to measure and the biomedical model of health still holds sway, health care organizations, insurers, and governments demand measure of what can be measured no matter how distant from the physician’s call to heal [7]. While routine measures of cholesterol, blood pressure, vaccinations and other routine treatment by assembly-line algorithms are useful, they greatly distract from the core value to the patient in health care. Patients value a caring relationship with their physician; they want to feel cared for [8]. The family physician, likewise, wants to care for people, not bodies, and excellent physicians thrive in the richly qualitative, complex, unpredictable social interaction between doctor and patient where relationships are built and human healing occurs [9].

This core value of relationship as health [10], however, is absent from the AAFP’s PCMH. Complex systems study of healthy ecosystems suggests building appropriate boundaries to a physician’s healing mission and practice site to insulate them from the conflicting demands of government, insurance and employer. Delaying and diluting the information and behaviour demands coming from these interfering non-patients can reduce information turbulence from distracting social forces outside the doctor–patient relationship.

Emphasizing the complex doctor–patient interaction while minimizing population-based algorithmic expectations for common primary care activities – vaccination, cholesterol reduction, obesity screening, etc. – can maintain mission and preserve diversity among medical homes, allow innovations to occur and improve the quality of complex primary care to unique individual patients [20].

Case study

Caring in Community Inc. [11] serves as an example of complex systems knowledge applied to the successful creation of a patient-centred medical home. Its story also emphasizes the important quality missing from the crippled AAFP view of a PCMH: patients are not clients, the doctor and patient relationship does not end when money is not paid, and thus a healthy living sustainable medical home must, like a healthy human home, be a welcoming refuge to all fellow travellers whether insured or not.

Social mission was first identified through a community needs assessment by a physician living embedded in a converted chicken coop in an underserved community. Affordable care for uninsured patients (20% of population) was found to be an unmet need which could be subsidized by simultaneous care for the remaining 80% of patients with health insurance.

Local outreach produced rapid patient recruitment by word of mouth. The new practice insulated itself from outside economic pressures and government health measures in order to hear clearly and respond directly to the health needs of their patients and community. Reliable growth of 15 patients a month was achieved in the first year through grassroots networking alone.

Low overhead costs of operation were identified as crucial to maintain flexibility and adaptability to meet the social mission. Large debt burdens were avoided through a house-call-only practice which grew into an exam room in the physician’s home to meet later identified patient needs. Bartered, discounted and free care could be encouraged without threatening fiscal stability.

Intimate scale was designed into a new clinic in year 4 of this experiment to build local connection and community health. The waiting area was designed critically narrow enough to encourage patients to converse freely and not ignore one another in awkward silence (fig. 3). The number of exam rooms was limited to three in a pod system to maintain close proximity to the patient experience in the waiting room and at the reception desk (fig. 4).

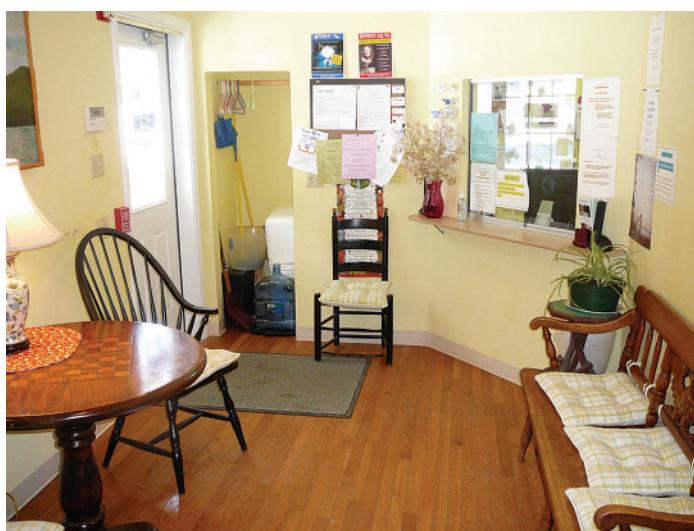


Figure 3
Photo of waiting room.

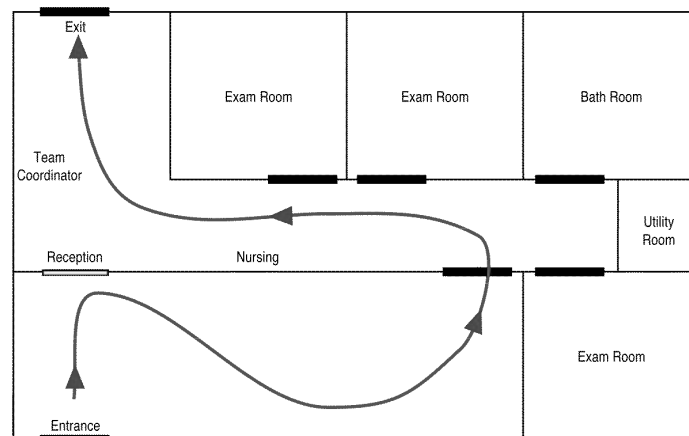


Figure 4
Floor Plan of New Caring in Community Practice.

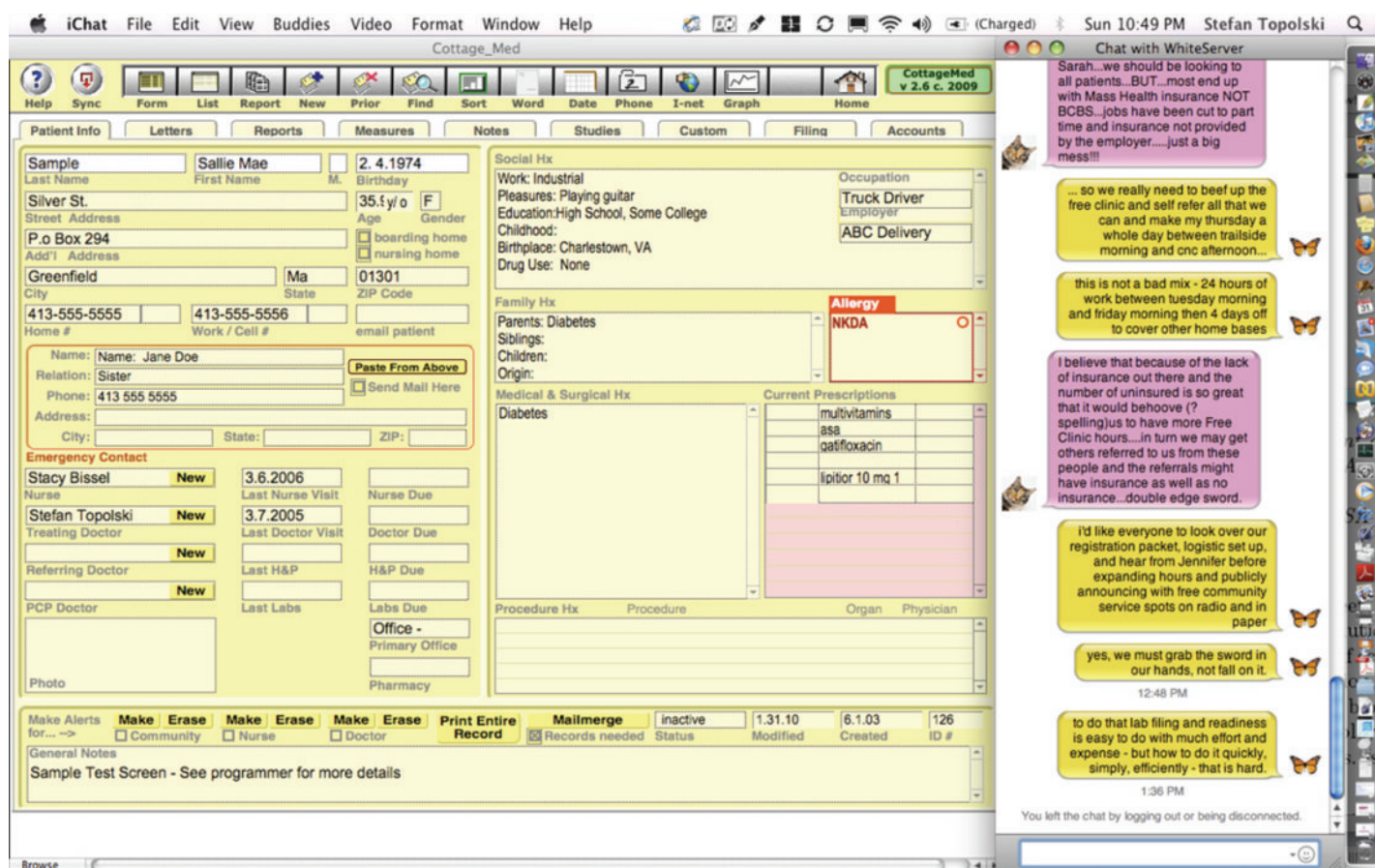


Figure 5
Photo of computer screen.

Flat hierarchy of the team encouraged cross training in all positions. The person who cleans also serves at the reception. The physician who cures has also swept floors and performed every other job role. Employee empowerment and ownership without fear of retribution has allowed problems to be identified sooner and corrected more effectively.

Open communication through the above measures has strengthened patient trust and community support for this non-profit project, even while the United States health care system remains driven by excessive profit and rising distrust of physicians [12].

Immediate feedback through very tight feedback loops has meant that a doctor immediately sees who is in the waiting room right outside his exam room door and constantly monitors how long patients are waiting. The physician hears conversations of nursing and reception from each exam room and can immediately step in to solve problems without delay.

Flexible processes and a fluid team structure allow for a rapid cycle of quality improvement. A small nimble team of physician, nurse, secretary and office manager can quickly identify problems, decide on changes, and test solutions in minutes and days rather than weeks and months.

Appropriate tools must be chosen to support the above mission and methods. For example, to feel less threatening each exam room has no medical equipment installed and physicians simply carry their single house call bag of tools into the room. No expensive diagnostic equipment which drives excessive testing and billing for income has been installed [13]. All care is focused instead

on the relationship between doctor and patient. In a U.S. System where everyone from patient to physician expects gold standard health care for themselves and no care for others, this case study has proven that a silver standard of affordable accessible health care is possible.

Appropriate affordable information technology has been essential to this project. Used computers and free electronic instant messaging replaced paper message delays allowing physicians to quickly answer urgent questions with the keyboard when in exam rooms with patients without pause or interruption (fig. 5). Most remarkably of all, this complex systems approach immediately identified the many potential efficiencies of an electronic medical record (EMR) and when no free EMR could be found they rapidly innovated a system by successfully simultaneously programming, testing, and using a novel EMR in 2001 – a full decade before most U.S. physicians used one. That EMR tool today remains free, open source, cross platform and is distributed worldwide.

Conclusion

Complex systems studies show how successful systems function – successful ecosystems, organ systems, social systems and health care systems. The study of complexity suggests that a better medical home may be small to be responsive and flexible, grassroots to be diverse, and decentralized to empower innovation. The medical home should be focused on early life where the biggest life changes can propagate over time, the accessible external aspects of health in our environment, and the immediate health problems as defined

by our patients. Most importantly, a successful medical home must be capable of quickly adapting to changing problems and new understandings of health and disease which still lie over the horizon in our future. Health care systems must innovate constantly with vastly improved and tightened feedback loops to enable patient-centred and community-driven health care.

If complexity helps us succeed in serving our patients as best we possibly can, the best medical home may be better at healing because health is more than just removal of disease or lowered levels of HgbA1c [14]. Health is instead a wonderful symphony of balance between body and environment, mind and society, instruction and empowerment [15]. It may be truly noble when we return to donating our monetary gain to care for those patients still in need of care [16]. It may be grassroots and small scale because the unique and infinitely complex contextual health needs of human beings suffer distortion, simplification, and even violence at ever larger scales of health system consolidation [17].

The best medical home may be supported by patients who are those most capable of measuring their health quality and the caring they receive, and this infers that the goal of health requires patient purchase at least in part with the loss of completely free care in order to achieve a strong feedback loop between patient and physician. It will be focused on the patient and not on inappropriate, simplistic, algorithmic, public health average recommendations that treat each patient as equal and identical without respect for patients and their innately complex and unique life stories.

The case study of the non-profit Caring in Community experiment has produced a personal, comfortable, caring, real human experience. It has succeeded in significantly increasing access to affordable and free health care while remaining fiscally sustainable without deficit for ten consecutive years. It has consistently shown the rich reward and patient benefits that come from understanding complexity.

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Glossary

Chaos – a behaviour commonly observed in human physiology, social systems and nature where apparent random variation actually has subtle pattern within it while remaining unpredictable even if starting conditions are known.

Complexity and Complex Systems – Systems such as ecosystems, governments, families, weather, and the human body which consist of many parts all interacting with each other. Exponential interconnectedness makes each interaction change as parts changed or removed. They cannot be simply understood as the parts of a ticking clock through full disassembly. Complex systems are robust while changing constantly with large energy input, a state which Ilya Prigogine termed far from equilibrium.

Semiotics – the process of making meaning out of signs made, observed, and derived from human life experience. It is here extended to include the knowledge, belief, and wisdom which may result from health as the process of making meaning out of life [18].

Turbulence – a confused motion of fluid, organizational elements, or more generally information itself caused by colliding conflicting interactions and characterized by unpredictability and inefficiency.

Rapid Cycle Quality Improvement – the literally simultaneous planning, implementation, review and revision of a quality improvement project noted for the speed of group project adaptation which can only be achieved in relatively small and nimble organizations.

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