# Systems Engineering Transformation to Value-based Healthcare


*"Standardized process guidelines belie the complexity of individual patient circumstances, and freeze care delivery processes rather than foster innovation. What is needed is competition on results, not standardized care. What is needed is competition on results, not just evidence-based medicine. There should be no presumption that good quality is more costly."*

**- Michael E. Porter, Redefining Health Care: Creating Value-based Competition on Results**

The systems engineering of a healthcare system must recognize the fact that clinical care delivery is a complex integration of human-centered activities that is increasingly dependent on evolving evidence, information technology and shared knowledge. The explosive complexity of medicine (e.g. there are over 68,000 diagnostic codes, thousands of approved procedures, over 10,000 FDA approved drugs and approximately 8000 references—including around 350 randomized trials—are added to MEDLINE each week) drives the need for health care to be routinely delivered by multidisciplinary teams of specialists.

In today's fragmented environment where providers are organized by discipline and operate independently, patients with complex conditions typically are referred to, or assume responsibility to seek care from diverse clinicians, resulting in, at best, spontaneously assembled, poorly coordinated "ad hoc" care teams. In many cases these siloed teams operate without the benefit of expert coordinating leadership and teamwork across multidiscipline providers and/or clear accountability and responsibility for patient outcomes. Without clear leadership and accountability, for many patients with complex conditions, suboptimal health outcomes and/or excessive costs of inefficient/duplicative care are almost inevitable.

Well-defined measurable goals must guide any healthcare transformation initiative. The most popular current mantra of health care reform: "transition incentives from fee-for-service to value-based

reimbursement" deserves careful consideration. What is meant by "value" in this statement? Since the "mission" of healthcare is to improve health for patients, the conceptual healthcare system delivery goal of "improving value" for patients must be aligned with the notion of enhanced achievement of health outcomes *that matter to patients* without increasing cost, or reducing costs without compromising outcomes.[1] However measurement of such patient-centered outcomes and associated costs can be difficult.

For example, care delivery performance measures such as HEDIS "quality" measures may measure a few outcomes that matter to patients such as mortality and safety, but are mostly focused on process measures that fall well short of actual outcomes[2]. For diabetes, for example, providers routinely report compliance with the screening guidelines and control of LDL cholesterol and hemoglobin A1C levels, even though what really matters to patients is whether they are likely to lose their vision, need dialysis, have a heart attack or stroke, or undergo a foot amputation.

Few health care organizations measure/report how their diabetic patients actually fare on such key outcomes. Outcomes that matter typically extend beyond survival/mortality and include achieving improved quality of life functioning, enhanced degree of health or recovery achieved, elimination of errors/ineffective care, reductions in treatment related complications, and sustainability of health[3].

Examples of outcome measures that matter to patients include measures such as: What was the amputation rate for patients with diabetes? What percentage of cancer patients went into remission? What was the quality of pain relief and exercise/sports functioning for patients who have had knee surgery?[4] Moreover, including patients in treatment decisions that trade risks, quality of life and cost will be critical to achievement of improved value-based care[5].

Like any services-oriented system, healthcare delivery can be considered to be a combination or integration of three essential elements — people (characterized by patients with diverse medical conditions/needs, individual providers and provider teams with diverse expertise/knowledge/skills, individual /shared situational awareness, shared values, etc.), processes (characterized by evidence-based practices/protocols associated with specific conditions, collaborative behaviors), and products (characterized by data/software, hardware, diverse care delivery equipment/devices, and facilities).

[1] https://hbr.org/2013/10/the-strategy-that-will-fix-health-care

[2] http://www.ncqa.org/hedis-quality-measurement/hedis-measures/hedis-2017

[3] https://www.academia.edu/2917824/Measuring_health_outcomes_the_outcomes_hierarchy

[4] http://familiesusa.org/sites/default/files/product_documents/HSI%20Quality%20Measurement_Brief_final_web.pdf

[5] http://revcycleintelligence.com/news/shared-decision-making-advances-value-based-care-outcomes