

# Complexity Leadership: A Healthcare Imperative

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**PROBLEM.** The healthcare system is plagued with increasing cost and poor quality outcomes. A major contributing factor for these issues is that outdated leadership practices, such as leader-centricity, linear thinking, and poor readiness for innovation, are being used in healthcare organizations.

**SOLUTION.** Complexity leadership theory provides a new framework with which healthcare leaders may practice leadership. Complexity leadership theory conceptualizes leadership as a continual process that stems from collaboration, complex systems thinking, and innovation mindsets.

**CONCLUSION.** Compared to transactional and transformational leadership concepts, complexity leadership practices hold promise to improve cost and quality in health care.

Health care is constantly changing, and the inherent complexity of the system is becoming more apparent. The Institute of Medicine (2010) stated that the pressing and well-established concerns common to all sectors of health care that impact quality are (a) rising cost and limited resources, (b) system inefficiencies, (c) increasing complexity, and (d) an ever-expanding evidence gap. Healthcare organizations can no longer manage this rising complexity with outdated linear solutions.

Rising costs and limited resources are pervasive in the U.S. healthcare system. According to Anderson and Frogner (2008), in 2005, the United States spent \$6,000 per capita on health care, more than double the median of 30 other industrialized countries. In 2009, this number rose to over \$8,000 per capita (Martin, Lassman, Whittle, & Catlin, 2011). Despite the high level of spending, U.S health care ranked only 37th in the world for quality (World Health Organization, 2010). It is evident from these data that we are spending money for health care without an equivalent return on investment. To add to the complexity, experienced nurses and other healthcare professionals to provide health care are a dwindling resource; it is estimated that by 2020, 36% of nursing positions will remain unfilled (National Center for Health Workforce

Analysis, 2004). In the middle of a worsening shortage of competent frontline workers and the aforementioned quality and cost issues, leaders are faced with a perfect storm of healthcare crisis. Leaders will need to see and understand the complexity of the healthcare system to find innovative solutions for improvement (Uhl-Bien & Marion, 2008).

Poor quality, outrageous costs, and a nursing shortage are symptoms of deeper underlying inefficiencies in the system. Yet, even when innovations come along to improve efficiency, they are not always implemented. For example, traditionally, patient records have been created on paper, requiring large physical storage spaces and delaying access to efficient medical care (Boonstra & Broekhuis, 2010). Boonstra and Broekhuis (2010) stated, "Despite the positive effects of EMR usage in medical practices, the adoption rate of such system is still low and meets resistance from physicians" (p. 231). They cite organizational leadership and change processes as two barriers to electronic medical record (EMR) implementation. Why is there resistance to proven solutions when the role of management is to ensure proven solutions are implemented? According to Uhl-Bien and Marion (2008), traditional leaders and managers are trained in applying known solutions to known problems, yet resis-

tance is still high even when evidence supports that a known solution has a positive impact on patient care, such as the EMR. This example of the lag in EMR implementation is just one of many examples that demonstrate a disconnection between traditional leadership models and the ability to adequately deal with current healthcare complexities.

The following article will discuss traditional leadership models in health care and the effects of operating under traditional assumptions. The contrasting option of complexity leadership will be introduced and connected to improved outcomes in health care.

### **What Is Wrong With the Current Leadership?**

Traditional leadership theories and models no longer adequately inform leader behaviors in health care (Plowman & Duchon, 2008). Historically, leadership theory has focused on special traits of leaders, situational demands, the interaction of leader traits and situational context, and the dyadic relationship between leader and follower (Bass, 2008). Traditional leadership research, according to Cherulnik, Donley, Wiewel, and Miller (2001), has only studied two outcomes: how leaders are chosen, and how well leaders function. These research traditions have defined a leader only as an individual who can influence followers through motivation, manipulation, action, reward, or punishment (Bass, 2008). Traditional leadership describes a role rather than a set of behaviors, and it places power in the position rather than in relationships (Plowman & Duchon, 2008).

The role of the traditional leader was developed in an age in which the world was focused on industrialization, making widgets (Bass, 2008). This contextual orientation still permeates organizations; however, these traditional ways of operating are insufficient to meet the complex problems facing the current healthcare system (Uhl-Bien & Marion, 2008). There is a need for dramatic change that impacts the social and economic operation of health care. Innovation is a subset of change that is both new and dramatic. Innovation dramatically changes the fundamental structure of how an organization operates both socially and economically (Weberg, 2009). Three problems associated with traditional leadership assumptions will be discussed below: linear thinking, organizational culture unawareness, and being unprepared for innovation.

### **Leaders as Linear Thinkers**

Leadership theories that were developed during the industrial era, and are the basis from which many current healthcare leaders have been trained, were focused on maximizing production of widgets and on reducing variance (Bass, 2008; Porter O'Grady & Malloch, 2007). Linear models assume that the input to the system will yield a proportional output. For example, a leader who tries to control costs by asking staff to arbitrarily use less gauze in an emergency department is operating under the assumptions that using less gauze reduces supply costs, and lower supply costs equates to a better bottom line. This leader has not taken into account why there is a need for the use of the gauze, whether using less gauze might increase staff time costs, or if there are better ways of reducing overall costs while maintaining patient outcomes. As a result, some frustrated staff may purposefully use more gauze in an effort to thwart the leader's unilateral decision. A focus on linear processes removes the capacity for the system to effectively change and innovate because effective change and innovation occur through relationship building, nonlinear processes, and co-evolution (Plowman & Duchon, 2008).

A focus on linear systems does not require leadership; it requires management. According to Uhl-Bien, Marion, and McKelvey (2008), management is the ability to apply known solutions to known problems. Leadership, on the other hand, is a process that occurs in situations where groups need to learn their way out of unpredictable problems and situations (Uhl-Bien et al., 2008). Those who subscribe to managing linear processes are not leaders and are not exhibiting leadership; their outcomes are not emergent, interactive, or adaptive and thus cannot be described as innovative. Rather, the outcomes of managed solutions are predictable, linear, and prescribed (Lord, 2008; Plowman & Duchon, 2008; Uhl-Bien et al., 2008). Although not every situation requires innovation, relying solely on managed solutions leads to a stagnant and maladaptive organization (Lord, 2008). For example, applying managed solutions such as Lean Production Systems and Toyota quality management to complex healthcare system problems is like applying a small bandage to a complex open tibia fracture. When linear solutions to problems are added to a broken system, they are not sustainable (Marion, 2008). This means that the organization will eventually fall back into the patterns

that required change in the first place unless the solutions become integrated into the operation and culture of the organization; they only serve to cover up the brokenness for a short time (Schein, 2004).

“Conventional views of leadership are based on the assumption that the world is knowable and planning and control brings about desired outcomes” (Plowman & Duchon, 2008, p. 129). This assumption is supported by several traditional organizational theories such as transaction cost, resources-based views, and contingency theory (Poole & Van de Ven, 2004). These theories contend that the goal of the leader is to control uncertainty and work toward absolute stability. In other words, the organization should resemble a smooth-running machine with little conflict, reduced deviation, and higher obedience from staff. For example, a top-down hierarchical model is believed by many leaders to be the most effective, while no consideration is given to other structural models such as matrix or circular models (Porter-O’Grady & Malloch, 2007). A focus on stability rather than movement assumes that change occurs occasionally. By viewing change as an episodic event, the organization works to decrease complexity, only changing when absolutely necessary and in essence, creating a reactionary system (Plowman & Duchon, 2008). This modus operandi is not sustainable when leading complex adaptive organizations. To thrive in the complex healthcare system, the healthcare organization must, at least, equal the complexity of the environment (Uhl-Bien et al., 2008). Leaders who attempt to standardize and control every action of their organization will quickly become unable to adapt or evolve at the speed that is needed to maintain relevance in the environment of health care.

### Organizational Culture Unawareness

Traditional leadership assumptions include the idea that conflict has a negative impact on the organization and that the leader acts externally on the system to create change toward a predetermined goal; these assumptions restrict traditional leaders from supporting innovation (Plowman & Duchon, 2008). Stacey (2007) suggested that leaders who are disconnected from the system and create visions and plans without input from the agents can push the system away from its desired state and thus increase organizational anxiety. For example, an emergency department director decides to make budget cuts by reducing staffing based solely on historical patient flow trends and

in the process creates a chronic short staffing problem as flow and acuity change unpredictably.

Schein (2004) suggested that organizational culture is made up of deep assumptions that drive behavior at the subconscious level, values that influence day to day work, and physical rituals or objects that define the work called artifacts. By understanding the impact of leadership behaviors within the organizational culture, the leader can better work with the complex intricacies of personality, people, and other agents in the system to aid in the development of appropriate solutions for the organization. Organizational culture has both a formal and an informal component (Egan, 1994). The formal culture defines the visible actions, beliefs, and structure of the organization as seen, superficially, by outsiders. This is manifested in the hierarchy, titles, mission, and overt behaviors of the employees and leaders. The informal culture represents the covert, sometimes subversive, connections that emerge behind the walls of the organization (Stacey, 2007). The informal culture is manifested in the “water-cooler” conversations, rumors, and almost silent consent or dissent toward formal initiatives. The informal culture is the lifeblood of the organization and holds the key to the deep assumptions that drive the action of the agents (Egan, 1994; Stacey, 2007). Leaders must work to develop strong network connections to both the formal and the informal cultures (Schein, 2004). Stacey (2007) stated the only time the formal culture changes is when the constant change of informal culture builds critical mass and overtakes the relative stability of the formal culture. Changing the deep assumptions of the organization requires new ways of acting and interacting within the informal culture. For example, simply adding a time clock to keep employees from being late is a superficial change. Addressing the underlying beliefs that allow late behavior to be accepted by the staff is a deep change. The latter requires much more energy and conversation than the former, yet it has more potential to last over time.

The inability of traditional leaders to tap the informal network for information and to give up the desire to solve all of the organization’s problems unilaterally compounds the lack of readiness for innovation.

### Unprepared for Innovation

According to Berwick (2003), healthcare workers need to develop competency for innovation. Weberg (2009) stated that innovations are new products and

processes that create dynamic social and economic change within systems. Poole and Van de Ven (2004) suggested that innovation requires time, space, and consideration of the organizational level and individuals who will be impacted (agency). According to Hardy (1974), because of the speed with which new ideas are created in health care, workers must now, more than ever, keep up to date on relevant knowledge and be able to utilize that knowledge to make informed decisions.

The traditional role of the leader is to vision, plan, and control (Bass, 2008). Whether acting from a punishment versus reward style such as transactional leadership, or a style in which the leader attempts to empower employees such as transformational leadership, the art of visioning and planning are core practices (Lord, 2008). The underlying power dynamic assumes the followers to be lacking the motivation to meet their own needs and the needs of the organization. Leaders operating under this assumption must be aware of the consequences of such behaviors, the foremost being that it heavily restricts innovation. Isolated leader visions often focus on personal aims. Conger (1998) suggested that when leaders spend an enormous amount of time, energy, and resources constructing organizational visions and trying to get them off the ground the vision, in a sense, is owned by the leader and not the organization. When a leader becomes totally invested in their own vision, the leader's perspective becomes limited and can lead to visions that are not effective for the organization or that lag behind (Conger, 1998). As information, globalization, and technology continue to grow and impact organizations, the leader can no longer afford to create unilateral visions. Organizational visions must emerge from the organization itself through collaboration and input from organizational stakeholders at all levels (Porter O'Grady & Malloch, 2007). Administrative leaders can no longer possess or access enough information to make well-informed decisions from their offices (Mckelvey, 2008).

Innovation readiness lives in the formal leader and the other stakeholders of the organization. Many of the current models of leadership in health care have led to the fragmentation of the system that is highlighted in this article. Next, a summary of the outcomes of the traditional leadership model will be highlighted, along with an introduction to a new way of leading to move us toward a more holistic and interdependent approach to change.

### Outcomes From Traditional Leadership in Health Care

There is a lack of innovation competency in healthcare leadership (Berwick, 2003). According to Melnyk and Fineout-Overholt (2010), it takes 17 years for new research to be implemented at the bedside. Electronic medical records are slow to be successfully integrated across healthcare systems and organizations (Berner, Detmer, & Simborg, 2005). Berwick (2003) stated that health care is filled with the ". . . overuse of unhelpful care, the underuse of effective care, and errors in execution" (p. 1969). In short, the system is severely broken. According to Hardy (1974), if leaders are not assessing and accessing knowledge, then they are simply technicians, applying known solutions to known problems. Innovation competency requires the leader to respond to adaptive challenges, the type of challenges that require groups to learn their way out of unpredictable problems (Gilbert, 2007). Adaptive response requires the leader to interact with, and leverage, the interdependencies of the system both externally and internally. The complexity model of leadership can provide insight to better ways of leading and working within organizations. The next section will discuss the core concepts and theoretical underpinnings of complexity leadership and further tie them to improved outcomes in health care.

### Complexity Leadership: An Introduction

Leaders must engage in the behavior and work of complexity leadership with an understanding that interconnectedness and change are normal operating conditions. Traditional leadership styles that assume a knowable and predictable world, top-down power dynamics, and organizational centric orientation are no longer effective for dealing with the increasing adaptive challenges that face health care in the information age (Porter-O'Grady & Malloch, 2007; Uhl-Bien et al., 2008). A new type of leadership is needed within healthcare organizations, based on adaptive capacity, understanding the external environment and connecting with the internal organizational culture and thriving in situations where groups need to learn their way out of unpredictable problems (Berwick, 2003; Shearer & Reed, 2004; Uhl-Bien et al., 2008; T. Porter-O'Grady, personal communication, August 24, 2010).

Complexity leadership provides a context of operation in which the behavior of leadership is to foster interaction from within the organization, increase network strength of the organization, and inject conflict to bust stability, creating the parameters and energy for constant change and adaptation (Uhl-Bien et al., 2008). Complexity leadership also focuses on the behavior and location of the leader within the system as opposed to the dyadic relationship between leader and follower (Bass, 2008; Mckelvey, 2008). From within the system, leaders can, and must, oscillate around many points of reference to set parameters to move the organization along a relevant trajectory (Vallacher & Nowak, 2008). For example, a unit leader could work with the staff to process data from the budget, patient flow numbers, and other metrics to come to a shared decision that accounts for the variability of the unit and the needs of the patients and staff. This approach is in contrast to the traditional notion that leaders control change and actions from outside the unit of action. In order for the leader to continually operate from within the system to encourage adaptation and emergence, the leader needs to think about the system impacts and to attain competency for innovation.

### Complexity Science: Foundations

Complexity science is a framework for studying organizations. The goal of complexity science is to explain how behavior and innovation emerges through self-organizing systems and with differing inputs to the system. Leaders in this system work to bring together diverse groups around problems and to set the parameters for action (Uhl-Bien & Marion, 2008). Leaders move from a role of directing and planning to one of facilitating information flow, context, and agent interactions, in essence, creating the container for change rather than dictating the change itself (Uhl-Bien & Marion, 2008).

The concepts that make up complexity science are derived from many disciplines, including systems thinking, theoretical biology, nonlinear dynamics, and complex adaptive systems (CAS; Goldstein, 2008). Each of these informs a different aspect of complexity. It is important to note that complexity is the integration and relationships of these core concepts, and it is more than the sum of the individual parts.

### Systems Thinking: Using the Informal to Change the Formal

Systems thinking is a framework for understanding both positive and negative feedback loops and self-regulating systems (Uhl-Bien & Marion, 2008). Positive feedback loops promote instability in the system and can be found in the informal culture of the organization (Stacey, 2007). An example of positive feedback is the ability for rumors spread at the water cooler to change employee actions and perceptions of a new initiative before it is officially announced. The informal network is always moving and continually challenges the status quo of the formal culture. Positive feedback loops are in constant movement and place pressure on the legitimate system's routines, moving the system closer to chaos. Conversely, negative feedback loops are those actions and behaviors that dampen change and move the system toward stability in the short term, for example, managers who dismiss new ideas proposed by their staff without consideration or exploration (Stacey, 2007). Positive and negative feedback loops can hold the organization on the edge of chaos by creating a constant push and pull effect that is always moving (Zimmerman, Plsek, & Lindberg, 1998). An abundance of negative feedback loops will grind the organization to a stagnant halt.

Systems thinking can provide a way for the complexity leader to influence conditions of action rather than directly managing actions in regard to organizational culture. For example, polling the staff about their opinions to a test of change, or watching for behaviors that undermine a change effort are specific ways that the leader can gather much-needed data using systems thinking. If the leader promotes a positive feedback loop, it may increase the system energy to achieve an innovation. For example, setting up a shared governance team to solve issues related to staff satisfaction would move the unit toward a different and more effective way of operating by directing the energy for change into projects that matter to the frontline staff. In the same way, a leader could identify the deep assumptions that drive a negative feedback loop and work to change the conditions from which the assumptions are sustained, moving the system away from static equilibrium. For example, a complexity leader could utilize interviews, conversation, and observation to determine the reason the staff do not embrace new supply scanning procedures, and work with those staff members to build a better system. This action shifts the energy from

fighting with staff to shared innovation around new processes. Static equilibrium is best known as the status-quo, a space absent of change. If the system is moving toward static equilibrium, the complexity leader must work to keep it on the edge of chaos, always evolving.

### **Theoretical Biology: Evolution of the Whole and the Parts**

Theoretical biology provides further insight into complexity by promoting anti-reductionism and co-evolving systems (Goldstein, 2008). In biology, it is nearly impossible to understand living systems by reducing them to their smallest parts. Instead, living systems must be examined by looking at the interaction of their parts with each other, and their environment. In an organization, taking a broader view of the system moves attention away from the dyadic relationship of the leader/follower dynamic and changes the point of reference for decision making to the whole system. Biological systems in nature are complex, in that they must interact with the environment, their own ecology, and multiple other systems that work to create and sustain life. The underlying premise is that systems are all connected and that a change in one subsystem impacts all the systems around it to an unpredictable degree. For example, introducing electronic medical records into the emergency department has consequences for patient admission, financial services, physician consultation, organization throughput, and many other areas, including the emergency department itself. Leaders must consider the perspectives of key stakeholders to see the system as a whole and to understand the impact to each subsystem.

Ibarra, Kilduff, and Tsai (2005) suggested that network changes impact more than the work (formal system) of the organization; they also impact social identity, interactions, and relationships (informal culture). The leader must be aware of the work flow and communication changes that accompany any other changes to the network.

The system will attempt to evolve regardless of leader input, reward, or motivation. The difference between the conventional leader and the complexity leader is that the complexity leader will take these ripple effects into account and use them as points to encourage more innovation. The complexity leader is embedded as part of the system and can use the position to secure resources, information, and other

inputs that can help shape the outcomes without predicting them. Systems that do not have access to information, context, or resources may create maladaptations that can negatively impact the organization (McKelvey, 2008). The impact of inputs to the system is further explicated through the concept of nonlinear dynamics.

### **Nonlinear Dynamics: Problems Can Create a Butterfly Effect**

Nonlinear dynamics are rooted in the science of mathematics. The main contributions to complexity science lay in the concept of attractors and sensitivity to initial conditions (butterfly effect). Attractors are the basins of dynamic equilibrium in which the energy of the system tends to settle over time (Vallacher & Nowak, 2008). For example, a leader's irrational vision can absorb the work of the organization and not allow for adaptation to environmental pressures. There are three types of attractors that the leader must be aware of: (a) fixed point, (b) latent, and (c) periodic. Fixed attractors are visualized as a black hole in which energy is trapped and cannot escape. Losada (1999) found that groups whose communication patterns mimicked a fixed point trajectory were shown to be low performing and focused on worsening defensive and negative language from which they could not recover.

Latent attractors are only noticed when they are destroyed (Vallacher & Nowak, 2008). Latent attractors represent the potential of the system and become visible when emergent change moves the system out of its current state of dynamic movement. For example, several problems with EMR implementation were not anticipated before it was implemented. These emergent problems could not have been completely predicted, but they emerged nonetheless. These emergent problems are latent attractors because they mobilize self-organization of people and resources in the system to solve the problems.

Periodic attractors are best described as rhythms in which systems oscillate between multiple points. Losada (1999) demonstrated that high-performing teams demonstrated this oscillation pattern in their communication styles, moving from inquiry to advocacy and back again without getting stuck on either. In health care, an example of this is the constant and healthy dialogue shifts between regulation and actual workflow of the practitioners. When focusing solely

on one or the other, the system begins to spiral in on itself without regard to the other issue.

For leaders, attractor awareness can lend insight into negative and positive feedback systems as well as signal the need for the organization to change trajectory. Attractors are evident in patterns of behaviors, deep assumptions, superficial behaviors, and other aspects of organizational culture. By looking for attractors and understanding their different impacts to the system, the leader is able to better define and manipulate the parameters that destroy negative attractors or create entirely new ones. For example, finding a fixed point attractor such as repeated resistance to EMR use by physicians or nurses can yield insight into why the organization is not moving along its trajectory.

Nonlinear systems also describe the impact that initial conditions of self-organization and interactions have on the trajectory of the system. The proverbial "butterfly effect" exemplifies the concept of interconnectedness and sensitivity to initial conditions through the following example: a hurricane in Florida caused by the flapping of a butterfly's wings in China. In theory, if the initial conditions are right, this small input into the system could have tremendously disproportionate outcomes, over time, in seemingly disconnected parts of the system (Vallacher & Nowak, 2008). For example, rumor of a corporate restructuring without sufficient employee notice can create premature adaptation and innovation strategies within the subsystems that can lead to anxiety or other fixed point attractors even though no actual contracts have been signed. This example highlights the need for healthcare leaders to set the parameters in which innovation occurs and gives meaning and context to important information entering the system. The leader must address these small inputs before they have a chance to create inappropriate or disproportionate changes. The complexity leader's role is to give meaning to such events so that accurate data inform the resulting activities. Anxiety, reaction, and change will occur regardless of leader intervention, but the complexity leader has a unique opportunity to facilitate the direction in which the organization moves in adapting and evolving around these inputs.

### **CAS: Simple Rules and Connectedness**

CAS adds the idea that complex systems are governed by simple rules, and that the value of organizations lies not only in the agents themselves but also in their relationships among one another (Goldstein,

2008). Agents are defined as anything or anyone that interacts in the system (Uhl-Bien & Marion, 2008), for example, people, computers, artifacts, and environment. The goal of a CAS is to achieve optimal operating efficiency and outcomes (known as achieving fitness landscapes) through continually changing, creating, and adapting to environmental and internal pressures (Goldstein, 2008). Agents in a CAS are semi-autonomous agents (individuals) that interact according to a set of rules (culture), and co-evolve together due to their interconnectedness (system) (Schein, 2004; Stacey, 2007).

Simple rules such as "quality patient care" or to "do no harm" drive many of the choices in healthcare systems. These simple yet powerful rules quickly become the point of reference for making many decisions related to the system in which the professions operate. According to Stacey (2007), systems governed by simple yet powerful rules will self organize and find solutions to ensure that they survive based on those rules. In health care, these simple rules are founded in the professional ethics of practitioners and the mission, vision, and value statements of the organizations. For example, medication errors violate the rule of "do no harm," and thus operating with medication errors threatens the survival of the local agents and their system. According to the principles of CAS, the innovations needed to reduce medication errors should come from the groups whose rules are being violated, and in this case, the patients, nurses, pharmacists, and physicians are working collaboratively. What tends to happen in many organizations is that the solutions are brought on from a conventional leadership point of reference and forced onto the system. The system must then adapt not only to a violation of its rules but also to an input to the system that originated from an incongruent culture: administration. The stress on the system leads to maladaptation and more work-arounds. The role of the complexity leader is to remove barriers within the organization so that innovations can emerge from the point of reference that is most impacted. In this case, point-of-service professionals should create the innovations that reduce medication errors, not the governing bodies, administration, or nonclinical quality agents, although they should all be part of the conversation.

Conventional leadership assumes that the workers in a system are mechanistic and focused on the task of the organization, while CAS accounts for agents' personal goals, self-service, emotion, and forethought

(Schwandt, 2008). The human behaviors are manifested through the informal culture and are displayed through the social interactions that occur minute by minute within the organization. The leader must develop a connectedness to the agents in the system and to use those connections to formulate the parameters that influence change and innovation through behaviors and not absolute power (Lord, 2008).

### **Complexity Leadership: Outcomes**

Complexity leadership provides a new model to tackle the rising costs, poor quality, evidence gaps, and increasing complexity of health care. Research connecting complexity leadership to health outcomes is still very new. Because of the difficulty in measuring emergent leaders, leader behaviors, and network connections, much of the published complexity research is based in computer simulation. This is beginning to change. A study by Hanson and Ford (2010) demonstrated that the core leaders in a hospital lab setting were not the formal director or administrators but rather the workers on the front-line, the customer service representatives. The study showed that the customer service core played an important role in information flow to all others in the lab and had heavy influence among other lab sections. These findings are contrary to what a traditional leader might expect, but from the complexity perspective, to get work done in the lab, one would have to interact with the customer service workers due to their high influence and information. The study by Hanson and Ford (2010) suggested that the assumption that formal leaders hold the core information for operation of the organization is not accurate. In this case, the complexity leader could instead focus on networking the organization with the customer service team to better exchange information and knowledge so that the entire lab team would have better outcomes.

Rowe and Hogarth (2005) studied CAS and complexity leadership practices in public health nursing. When the formal leaders embraced the movement of decision making and policy setting from administration to the nurses on the frontline, the investigators reported an increase in experimentation and innovation that led to new service delivery models, and higher levels of responsibility and decision making for the practitioners. This study lends insight into ways to

improve efficiency, quality, and accountability in health care, all of which can impact cost.

The apparent evidence gap between research and actual best practice for the patient may be mitigated through the complexity model as well. If practitioners were held more accountable and given more autonomy to practice to their appropriate educational level, then change could occur in a more constant and fluid way. For example, implementing best evidence on catheter care would not require a committee to approve the new practice but rather the practitioner could use best evidence, current clinical judgment, and patient preference to provide updated and validated care (Melnik & Fineout-Overholt, 2010). Allowing the practitioners to make these decisions takes the whole burden of complexity off of the formal leadership and policy setters and disperses it throughout the system so that the system can evolve accordingly.

Admittedly, complexity leadership is not an overnight solution and is quite difficult to accomplish itself. Leaders in health care can begin to shift their thinking and work toward complexity behaviors to shift the organizational culture from one of hierarchy, inefficiency, and high cost, to one that embraces complex systems and continually searches for value-added innovations. This is really about a paradigm shift.

### **Conclusion**

This article has discussed the gap that exists between traditional leadership paradigms, the need to consider both the formal and informal organizational culture, and the need for leaders to develop innovation competence. There is incongruence in the way leaders currently lead in health care and the leadership competencies that will guide our healthcare organizations effectively into the future. A new framework, complexity leadership, is proposed as a way to view and operate within an organization or system. As more and more political, environmental, and social pressure is placed on healthcare delivery and outcomes, the need for innovation and rapid change becomes more evident. By leading at the intersections, through strong networking, allowing for distributed decision making, and fostering conditions for the organization to quickly and effectively adapt to these pressures, we can assure survival of healthcare organizations. Failure to promote rapid



innovation and change capabilities will lead to obsolescence.

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