How to Lead the Way Through Complexity, Constraint, and Uncertainty in Academic Health Science Centers

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Abstract

Academic medicine is in an era of unprecedented and constant change due to fluctuating economies, globalization, emerging technologies, research, and professional and educational mandates. Consequently, academic health science centers (AHSCs) are facing new levels of complexity, constraint, and uncertainty. Currently, AHSC leaders work with competing academic and health service demands and are required to work with and are accountable to a diversity of stakeholders. Given the new challenges and emerging needs, the authors believe the leadership methods and approaches AHSCs have used in the past that led to successes will be insufficient. In this Article, the authors propose that AHSCs will require a unique combination of old and new leadership approaches specifically oriented to the unique complexity of the AHSC context. They initially describe the designer (or hierarchical) and heroic (military and transformational) approaches to leadership and how they have been applied in AHSCs. While these well-researched and traditional approaches have their strengths in certain contexts, the leadership field has recognized that they can also limit leaders' abilities to enable their organizations to be engaged, adaptable, and responsive. Consequently, some new approaches have emerged that are taking hold in academic work and professional practice. The authors highlight and explore some of these new approaches—the authentic, self, shared, and network approaches to leadership—with attention to their application in and utility for the AHSC context.

Academic medicine is in an era of unprecedented and constant change due to fluctuating economies, globalization, emerging technologies, research, and professional and educational mandates. Since the beginning of the 21st century, we have witnessed worldwide economic changes and pressures to integrate technological advances and new research areas such as big data and genomics. In addition, there has been an increasing focus on public health and patient-centered activities, health care system transformation, global health, and medical education reform issues to address.[1–6] These changes have ushered in a new level of complexity, constraint, and uncertainty for academic medicine. It has been suggested that academic health science centers (AHSCs)—which are university-affiliated institutions whose mandate includes advancing the academic missions of research, education, and clinical care, such as medical schools, health science faculties, academic medical centers, research institutes, etc.—need to radically change to become more innovative, adaptable, and collaborative to ensure survival.[7] In particular, each part of the tripartite mission of research, education, and clinical care must expand to include contributions to health, innovation, community, and policy.[8] This expansion could involve addressing anything from contributions to the local economy, to developing and implementing health human resource policy, to regionalizing research, to creating innovative approaches to care. Given these new challenges and emerging needs, we believe the leadership methods and approaches AHSCs have used that led to successes in the past will be insufficient.

Current AHSC leaders, including deans, chairs, directors, researchers, or teachers, are often presented with competing academic and health service demands, including demands to reduce budgets, raise revenue, work strategically, and stimulate innovation. They are required to work with and are accountable to a diversity of stakeholders, including patients, deans, hospital boards, chief executive officers, professional societies, lay groups, payers, foundations, and learners. The AHSC setting is a unique and highly stressful environment which is populated by bright and talented academic scientists and professionals who require a diversity of skills to meet both the academic and clinical missions. These faculty members may or may not be employees of the university. Regardless, they must balance and integrate their difficult and intimate clinically related work with the multiple scholarly, educational, and service agendas of the university, public, and community. Leadership in this environment must be able to generate trust and respect, as well as build the collective motivation and capacities of faculty members to work together creatively to address the new and complex challenges which face academic medicine. Given that context is central to the emergence of particular leadership models and processes, the increasing complexity created by the competing demands in AHSCs requires its own unique combination of leadership approaches and practices.[9]

In this Article, we review the most researched leadership paradigms in the

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field of leadership studies[10] and their relevance to and application in AHSCs. While these paradigms have value, the most recent leadership literature has identified newer leadership paradigms that are taking hold in academia and professional practice.[11,12] We subsequently describe how these new and emerging paradigms can be applied to both formal (those with official positions or titles with authority) and informal (those without official positions or titles with authority) AHSC leadership. Our premise is that AHSC leaders must embrace this paradigm shift in the leadership field to dynamically use both current and new approaches (as the situation or context demands) to be successful and effective (see Table 1).

Traditionally, the leadership research field has primarily used cross-sectional, static, and quantitative approaches (e.g., surveys, quasi-experiments, network analyses) to look at outcomes. More recently, however, because of a recognition that contexts, temporal dynamics, groups, and social systems shift over time and create the variability that characterizes leadership behavior, the field is evolving to focus on how leadership occurs within continually changing social systems.[9] Methods to study such rapidly changing and complex contexts have included enhanced qualitative methods, advanced computational models, true experiments, and agent-based simulations. Of note, however, is the paucity of specific leadership research in the AHSC setting. Therefore, in service of supporting AHSC leaders to enable their current work and enhance their effectiveness and success, we

Table 1

Current and New Academic Leadership Paradigms

	Current paradigms			New paradigms			
		Hero					
Component	Designer (or hierarchical)	Military	Transformational	Authentic	Self	Shared	Network
Focus of practice	Individual	Individual	Individual	Individual	Individual	Collective	Collective
Leader's role[a]	Formal	Formal (usually)	Formal	Formal or informal	Formal or informal	Formal or informal	Formal or informal
Leader's function is to …	• Design work structures and processes • Divide and coordinate responsibilities and accountabilities	Command and control	• Inspire • Get buy-in • Support and encourage	• Demonstrate behaviors that generate trust and respect • Demonstrate a values-based approach	Be self-aware, self-reflect, exercise self-control, and self-manage	Be a facilitator, empowering others whenever possible	Perceive, use, enable, and manage formal and informal networks
Faculty members' role is to …	Be a human resource (e.g., a cog in a machine)	Follow	Buy into the vision	Provide perspectives and feedback	Provide feedback	Assume some leadership responsibilities	Build and leverage network relationships
Goal	Deliver specific, desired outputs	Win or survive	Effect a desired, specific change	Generate trust, commitment, and productivity	Enhanced leadership behaviors and performance	• Empower others to lead when possible • Leverage diverse capabilities	Address shared and emergent issues
Utility	• Stable environments • Simple or repetitive work	Urgent or crisis situations	Required or compelling change	Stressful or uncertain environments	• Enhanced interactions • Role modeling	• Broad ownership of initiatives • Enhancing leadership capacity	Big, complex, and novel problems that require creative solutions
Limitations	• Not easily adaptable to new demands • Faculty do not want to be treated like resources • Leader may be experienced as a taskmaster	• Fosters passivity and dependence in faculty and competition among colleagues • Idealization of leader is not sustainable • Promotes self-protective culture	• Faculty do not want to be sold a vision • Does not engage faculty to contribute	• Can be used as an excuse for not managing qualities that lead to bad behavior • Ineffective if leader's values are not shared by others in the context	• Self-assessment and feedback can be inaccurate • Must be used as a foundation for other leadership approaches	• Takes more time to make decisions and changes • There can be conflict between the single leader and team structures	Not available (this field is still in its infancy)

[a]Formal (official position or title with authority) versus informal (no official position or title with authority).

have gone beyond the limited literature in this context to share what is current in the broader field of academic leadership.

Current Paradigms of Academic Leadership in AHSCs

AHSC leaders often rely on the nonmutually exclusive hierarchical notions of leadership that were popularized in the 18th and 19th centuries.[13–15]

Leader as designer (or the hierarchical approach)

The metaphor of the leader as designer emerges from the perception of an organization as a machine or a factory.[16,17] The machine organization's purpose is to deliver specific, desired outputs such as health professionals or scientific discoveries. Individuals within the organization are seen as components (e.g., cogs in a machine) who work according to specific procedures or rules.[18] Control is achieved by dividing the organization into functional units, which have precisely defined and standardized skills or work.[19] Hospitals presume that every health professional has such a standardization of skills. Checklists and policies (e.g., standard operating procedures or SOPs) ensure further reliability. Thus, the leaders' function is to design the work structures and processes, and divide and coordinate responsibilities and accountabilities. They are directive, distant, and uninvolved with the people who do the work. For example, new chairs would likely initially use the designer paradigm. They would define new priority outputs for the department, such as genetics research or an interdisciplinary fellowship, and create new leadership or administrative roles to achieve those goals.[20] Evidence of this mechanistic metaphor is often seen with terms such as structure, process, deliverables, or benchmarks. However, its prominence in academic medicine overemphasizes its utility (see below) given the rapidly changing and complex environment.

When aspects of the environment are stable and certain or elements of the work are simple or repetitive, this paradigm can be useful and can sustain the organization. However, when environmental demands or priorities change such that responsiveness and adaptability are required, this approach will falter if there is rigid adherence to these predefined structures, processes, and outcomes. For example, if a donor approached a chair about substantially investing in stem cell research, rigid adherence to previous priorities could prevent the chair from creating a new program or reallocating resources. Additionally, faculty members will most likely not want to be treated as a resource and may experience their chair as a taskmaster who is impersonal and distant.

Leader as hero

Our culture admires heroes, and AHSCs are no different. The leader-as-hero metaphor is intended to evoke the image of a single, charismatic, and courageous leader who is visionary and knowing. Informed in part by the military, "heroic" leaders usually have formal positions and influence organizational members to exert exceptional effort and engender the virtue of self-sacrifice in an environment that is perceived to be like a battleground.[21,22] These leaders articulate an appealing vision, communicate high expectations, and model desired behaviors. They perceive their people as followers who need to be commanded, controlled, and even discarded in pursuit of winning or survival. Their followers follow because they believe in the leader and in their own ability to contribute to the overall mission and mandate of the unit.[23] However, such leaders inevitably fail as idealized expectations of them are impossible to sustain. This leadership approach can also, unfortunately, foster passivity and dependence in followers, as well as competition among colleagues. Additionally, this leadership paradigm promotes a culture of "rounding up the troops" to defend or compete against "outsiders." Promoting such a self-protective culture has the potential to undermine current academic agendas of fostering interdisciplinary, interfaculty, and interuniversity collaborations. In the AHSC, terms such as strategy, mission, battles, deputy, and director often illuminate the presence of the military metaphor.

However, the military orientation does have value in urgent or crisis situations. In such circumstances, these leaders must set clear directions and roles, focus on the bottom line, and hold people accountable. If a postgraduate program fails its accreditation, for example, such urgency would be created. Faculty members might afford the postgraduate program director a "take charge" approach to ensure the program's survival. Although faculty might ordinarily find being "commanded" offensive, they would be more inclined to obey or go above and beyond to support successful accreditation.

The heroic leader also embodies elements of transformational leadership.[24] Transformational leaders enhance followers' awareness of task outcome importance, induce them to prioritize organizational interest, and stimulate higher-order aspirations, all with a sense of urgency. Such leaders advocate compelling reasons for change by increasing awareness of problems and create an inspiring vision, while providing support and encouragement. Kotter[25] popularized transformational leadership with his change framework, which includes such notions as "communicating vision for buy-in." Increasingly, however, knowledge workers such as AHSC faculty do not want to be sold a vision that they had no part in crafting.[23] The myth that any leader alone can determine what is important for an academic unit must also be challenged in today's complex, dynamic, and multifaceted contexts.

Within AHSCs, transformational leadership approaches have been effectively used when fiscal or curricular imperatives have presented compelling reasons for a specific change.[26,27] In the current research climate of constrained funds and pressure for interdisciplinary work, some deans might try a transformational approach, and it may or may not be successful depending on the other players involved. Deans, for example, would attempt to passionately persuade department chairs of the need to change the current research infrastructure to advance interdisciplinary research as a top priority. Their unique vision for interdisciplinary work would be framed as embracing an opportunity, solving an issue, and achieving an aspirational good for health care's future. Success would be contingent on the chairs' trust and belief in their dean and their willingness to buy in to the dean's vision.

New and Emerging Paradigms for Academic Leadership in AHSCs

Given changing environmental demands and the complexity of organizational work, leadership scholarship has moved beyond the designer (or hierarchical)

and heroic leaders. The importance of individual authenticity and self-leadership, as well as leadership that is conceptualized as a changing, social, collective process involving many (in the shared and network leadership approaches), is now recognized.[11] These paradigms are not mutually exclusive; they have elements that overlap or that can be combined, and they are increasingly described in the most current leadership literature as the leadership approaches for success and effectiveness in the 21st century.[12]

Individual leadership paradigms

Authentic leadership. Worldwide, there is a growing crisis of confidence in leaders' capability and integrity.[28] The authentic leadership paradigm emphasizes positive role models who demonstrate honesty, integrity, and high ethical standards.[29] Nowhere is this more important than in the AHSC, where research or education leaders may have little formal authority over faculty members. Authentic leaders consistently demonstrate behaviors that generate trust and respect, and a values-based approach that includes relational transparency; an internalized moral perspective; unbiased and balanced processing of issues; and self-awareness of how they make meaning of the world, their impact on others, and their strengths and weaknesses.[30] They are transparent by openly communicating information and sharing aspects of themselves, including thoughts or feelings. They solicit disparate views and make hard decisions in a fair and balanced way. And, perhaps most important, their decisions and behaviors are clearly guided by expressed internal moral and ethical standards and values informed by their life experiences.[31] They appreciate that these experiences give meaning to their identities, work, and core purpose.[32] They also seek honest feedback in service of personal leadership development and setting learning goals.

The AHSC is also struggling with a lack of confidence in leadership, with demands for change.[33] In health care, leaders who have high authenticity ratings have been positively associated with employee trust, job performance, and voice (i.e., speaking-up behaviors).[34] A national study of AHSC deans identified that the authenticity characteristics of enacting espoused shared values and relational transparency were the most important enablers of systemic leadership and addressing complex problems.[35] In business, leader authenticity has also been associated with high employee organizational commitment and team productivity.[36,37] The trust generated can sustain employees' continued engagement at times of stress, adversity, or uncertainty. Imagine that a dean was perceived by his/her department chairs to "walk the talk," have integrity, demonstrate fair and balanced consideration of the issues, and articulate how decisions are guided by a clear purpose and values. What if he/she shared aspects of himself/herself, showed vulnerability, and appreciated his/her strengths and limitations? Prior studies[34,36,37] suggest that the chairs would be more likely to trust the dean and share their ideas with him/her, as well as perform better and even continue their commitment in times of stress and uncertainty.

Authentic leadership is not always appropriate, however. If a leader's core values are not shared by others in the context, faculty members will be reluctant to support or promote those values, and organizational success will be limited.[38] Additionally, being committed to being yourself can be inappropriately used as an excuse for not managing "bad" qualities that lead to bad behavior.

Self-leadership. Self-leadership is "a process through which individuals control their own behavior, influencing and leading themselves through the use of specific sets of behavioral and cognitive strategies."[39] Self-leadership involves deliberate, continuous reflection on one's motivation and typical ways of thinking, feeling, and behaving. Self-leaders commit to employing strategies that increase their self-awareness, self-reflection, self-control, and self-management to enhance their leadership behaviors and performance.[40,41] They endeavor to encourage behaviors that will lead to successful outcomes while suppressing undesirable behaviors. Self-directed learning strategies may include self-observation, goal setting, practice, self-correcting feedback, self-rewards, and creating external environmental cues that encourage constructive behaviors. These leaders see feedback seeking, both formal and informal, as a priority.

Managing thought patterns is an equally important capability for self-leadership. All individuals have unique mental models that they apply to their work; however, there is often incomplete awareness of what those models are, and what alternative models there are. Effective self-leaders first develop insight into their current mental model, which may include assumptions or beliefs that are triggered by troubling situations (see below). The leader's goal is then to employ specific cognitive strategies that will replace those models with thought patterns and thinking habits that can positively impact his/her performance. Such strategies may include mental imagery, positive self-talk, or task reframing for optimal performance and enhanced motivation. Doing so allows the leader to enhance the effectiveness of his/her interactions and role model such behaviors for his/her peers and employees.

For example, if a faculty member requests a discussion because of a reduction in his/her curriculum time, the curriculum director may pessimistically anticipate that the meeting will be hostile or complaining. To shift perceptions, the director would first recognize these assumptions and then deliberately try to shift his/her thoughts to consider becoming less certain about the faculty member's agenda. In doing so, the leader's attitude would then shift to one of inquiry and learning at the meeting rather than of judgment and defensiveness. Perhaps the faculty member has novel or innovative ideas for this curriculum change. If the director has shifted his/her thoughts, then he/she would be more likely to have a more positive and productive interaction with the faculty member, as well as demonstrate effective role modeling. AHSC leaders must also be able to manage their thinking via the skilled employment of a diversity of complex problem-solving strategies.[41]

Consistent with self-leadership, Souba[33] advises that transforming health care begins with AHSC leaders transforming themselves through self-awareness and self-management. In particular, Souba states that effectiveness is critically linked to AHSC leaders' ability to affect a "shift in the way in which we see (experience) life—the world, others, and ourselves" so that "we will deal with and interact with the world, others, and ourselves differently."[33] As self-leaders, academic faculty members must devote time to anticipating and reflecting on their interactions, soliciting

feedback from, and creating strategies to trigger effective behaviors with colleagues, not just patients. Observing other leaders, reading literature, or participating in formal development can also enrich self-leadership capability, thereby fostering self-efficacy, resilience, and better leadership in others.[42,43] Self-leadership is a necessary component of, but on its own is insufficient for, effective leadership because leadership is a social process which is embedded in relationships with others. It is a foundation for other leadership approaches.[44] Additionally, if the leader's self-assessment and the feedback he/she receives are inaccurate, the leader may be misdirected in his/her efforts at self-regulation and self-management.

Collective leadership paradigms

Individual leadership capabilities, while essential, are insufficient for organizational success. No one leader can know or anticipate everything because of the complexity of job demands, changing environmental dynamics, and the involvement of multiple internal and external stakeholders. Increasingly, leadership scholars are emphasizing collective notions of leadership that encourage the engagement of a diversity of individuals in an ongoing conversation about their organization's direction.[12] Two of these 21st-century collective paradigms involve sharing leadership and using networks to stimulate motivation, creativity, and a shared sense of ownership of the organization's mission.

Shared leadership. The philosophy of shared leadership is that almost everyone is capable of sharing some of the burden and responsibility of leading in nearly all circumstances.[45] Shared leadership is "a dynamic, interactive influence process among individuals where the objective is to lead one another to the achievement of collective goals."[46] Shared leadership can promote greater expediency, accuracy, creativity, and innovation. Given employees' desires to participate and have a meaningful impact, there is an increasing demand for shared leadership in a variety of complex and dynamic situations. A shared approach enables broad ownership of initiatives and enhanced leadership capacity.

Shared leadership builds on the authentic and self-leadership paradigms to engage informal and formal leaders as facilitators who empower others whenever possible. Four forms of shared leadership have been described in the literature. First, leadership can be deliberately *rotated* so that influence passes from one person to another. For example, within a committee, the leadership of meetings might rotate every month or year.

A second shared approach involves the creation of a team whose membership possesses differing perspectives and complementary expertise, capabilities, experience, and strengths, such that all areas are covered. The group must appreciate and respect the value of members' differing strengths and viewpoints for their collective work. In this *integrated* form, the team works together, mutually influencing each other toward a shared vision or solution, or assigns responsibilities to those who are best equipped or able to take them on at any given moment. For example, division heads might select an executive team whose membership represents expertise in research, education, and clinical programs, as well as other divisional priorities such as diversity or finance. The selection of the team by the division head would attend to individuals' perspectives, styles, and self-leadership strengths to ensure collective capacity to address complex issues through respectful dialogue and debate. To fully leverage this capacity, discussions and decisions would be consensus based, thereby empowering everyone to meaningfully contribute. At times, the team may defer to a particular member's advice, such as addressing a research issue to the research director, given his/her expertise and connections.

The third form of shared leadership (*distributed*) emphasizes dispersing and empowering leadership roles widely in an organization and encouraging motivation based on people discovering their gifts and using their expertise. Within a broad structure of well-defined values, vision, and mission, groups are encouraged to self-organize and collaborate in service of particular goals. These groups can span geographic settings, or be virtual (non-colocated), and operate outside formal authority structures. The role of formal leadership is to provide external empowerment and support, enable resource acquisition, remove barriers, and create an appreciative climate for all inputs. Within a department, for example, chairs would invite faculty members to bring their interests to them. In alignment with departmental goals, they would facilitate linking those with shared interests and support their work. This approach allows autonomy and empowers interested groups to construct shared academic initiatives through grassroots innovation, as well as learning across boundaries.

The fourth form is *comprehensive* shared leadership and is about creating a culture where initiative is valued from any source within a well-defined scope of goals and values that are defined by the organization. Everyone feels a sense of ownership of the agenda and a responsibility to engage or lead when circumstances call for it. For this approach to succeed, there must be a strong enabling culture that discourages top-down leadership. The Indiana University School of Medicine applied this approach, using appreciative inquiry, which spawned multiple creative initiatives to create a culture of professionalism, and ultimately resulted in a core values and guiding principles document being signed by every faculty member, graduate, resident, and medical student.[47]

Shared leadership does not eliminate the need for formal leadership roles; rather, they are intimately and dynamically linked.[48] Formal leaders help design the teams and empower them by asking for solutions, encouraging initiative, setting goals or problem-solving expectations, providing feedback and modeling leadership-sharing behaviors, and being a willing recipient of the ideas and opinions of others. Additionally, formal leaders consistently monitor the organization to ensure that it stays aligned with its direction and values. AHSC leaders would involve faculty members in problem solving and ownership of solutions. As groups self-organize, the formal leader would shift to supporting and ensuring alignment with organizational goals and values.

Shared leadership presents a tremendous opportunity for AHSC leaders to leverage the collective capacity of talented faculty. However, faculty must have skill at listening and bidirectional influence (an openness to being influenced by the ideas of others as well as a willingness to try and persuade others of the merits of their own ideas), which requires

respect, clear communication, and a capacity to keep egos in check. At an organizational level, faculty creation of a common vision, purpose, and values for which they are accountable and can be recognized is essential. Shared leadership can be challenging, however, in circumstances where there is cultural resistance to change from a singular model or conflict between the singular leader and team structures.[49] Additionally, decision making and changes take more time in a shared model because it uses consensus-based approaches.

Network leadership. All organizations are social systems comprising relationships among both individuals and groups. Network leadership scholars assert that "leadership can be understood as *social capital* that collects around certain individuals and groups … based on the acuity of their social perceptions and the structure of their social ties."[50] Social capital is the collective value of all social networks (or who people know) and the inclinations that arise from these networks to do things for each other (reciprocity norms).[51]

Network leaders accurately perceive, use, enable, and manage these network relations, both locally and beyond as well as formally and informally, to infer the influence that individuals or groups may have.[52] They deliberately engage different groups or individuals to facilitate their unit's goals or determine how goals are being undermined. Because of the lack of constraint of formal structures, a network approach enables leaders to responsively address shared and emergent issues as they arise. For example, by developing relationships with other deans and department chairs, a dean of medicine may discover that the obstruction of an interdisciplinary drug development program can be attributed to a group of faculty members within particular medicine and pharmacy departments.

Leadership in this approach involves investing in the development and nurturing of relationships to accumulate social capital. The extent to which leaders play a role in their individual, organizational, and interorganizational networks (formal and informal) influences their effectiveness.[53] If the previously mentioned medicine dean had cultivated relationships with the pharmacy dean and some relevant pharmacy and medicine chairs and was relatively central in this network, he/she would be in a good position to deal with the obstructing faculty issue. He/she could solicit those leaders to identify who to communicate with or gain support from to facilitate the engagement of the obstructing groups or to bridge relationships between the supporting and opposing faculty.

At an organizational level, AHSC leaders link with others for operational, personal, or strategic purposes. A study of medical education leaders noted that strategic networking connected them to a set of sources that could provide support, help them achieve organizational goals, work through coalitions, and keep track of what is going on.[54] Faculty of medicine chairs identified that such networks serve a critical role in achieving department goals.[43] At best, these relationships transform into mutually respectful and influencing ones. Networks are particularly useful when the problem or opportunity is big, complex, and novel and the solution requires new ideas.[55] For AHSC leaders, this means enabling the conditions for diverse thinkers from different contexts to self-organize for creative problem solving and learning.[56] For example, a pharmacology research leader may be approached by a donor who wishes to invest in multiuniversity drug or technology projects that meet population needs. The donor insists that industry be involved to ensure that these discoveries are implemented. To take advantage of this opportunity, the researcher will need to build a network of interested and diverse scholars and practitioners from different disciplines and contexts (e.g., community health, pharmacology, pharmacy, industry, bioengineering) to begin a conversation about possibilities. The membership will be fluid, and people may enter and leave depending on the needs or projects that emerge. To start, this leader will likely examine his/her own networks to identify whom to speak with to help identify individuals who could contribute to the conversation and help steer this opportunity. The leader would then need to figure out how to connect with these individuals, depending on the degree of familiarity they share.

As a routine, a department chair might pursue relationships with chairs from other health science faculties locally or internationally, to identify collaborative opportunities, pool resources, fundraise, or identify shared issues for interdisciplinary research. Chairs would weave together networks within and beyond their department by identifying individuals' interests and challenges, connecting people strategically, and serving as catalysts. Network awareness would also inform their connecting of faculty for career development and advancement.

The study of networks and leadership is a field still very much in its infancy. As such, the question of under what circumstance is it or is it not effective for leadership to be distributed in a network remains to be answered.[57]

Conclusion

Given the AHSC system's complexity with multiple stakeholders, accountabilities, and changing demands, as well as the constraint and uncertainty they face, faculty leaders need to build on their current leadership approaches to include new and emerging paradigms into their repertoire. The AHSC, like any organization, requires its own unique combination of leadership approaches. Investing in authentic, self, shared, and network leadership capabilities can yield trust in and respect for the leadership, and facilitate personal development, relationship building, and the creative problem solving necessary to address the new and complex challenges facing academic medicine. Additionally, the application of the collective approaches of shared and network leadership throughout an organization encourages faculty motivation, builds creative capacity, and forges broad engagement with the academic mission.

It behooves national and local health science organizations to encourage, value, and support these capabilities in their current and emerging leaders. Leadership selection processes should go beyond identifying academic expertise to attend to the leadership capabilities of applicants. In particular, behavioral interviews can illuminate prospective candidates' favored leadership approaches. Recognizing that most academics have little if any training in leadership, AHSCs must also invest in leadership development.[58] Development can take the form of local or off-site

courses, executive coaching, or distance learning depending on the participants' needs and preferred learning methods. By selectively and flexibly applying the leadership approaches we have outlined, AHSC leaders will be able to leverage the unique and creative capacities of their faculty members and garner shared ownership of the future of academic medicine.

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References

1 Daschle TA. Academic medicine in a transformational time. Acad Med. 2015;90:11–13.
2 Iglehart JK. Institute of Medicine report on GME—A call for reform. N Engl J Med. 2015;372:376–381.
3 Topol E. The Creative Destruction of Medicine: How the Digital Revolution Will Create Better Health Care. New York, NY: Basic Books; 2012.
4 Blumenthal D, Compton-Phillips A, Cosgrove DM, et al. Innovation in health care leadership. N Engl J Med. 2014;371:e26.
5 Okun MS. Deep-brain stimulation—Entering the era of human neural-network modulation. N Engl J Med. 2014;371:1369–1373.
6 DiSesa VJ, Kaiser LR. What's in a name? The necessary transformation of the academic medical center in the era of population health and accountable care. Acad Med. 2015;90:842–845.
7 Kahn MJ, Maurer R, Wartman SA, Sachs BP. A case for change: Disruption in academic medicine. Acad Med. 2014;89:1216–1219.
8 Borden WB, Mushlin AI, Gordon JE, Leiman JM, Pardes H. A new conceptual framework for academic health centers. Acad Med. 2015;90:569–573.
9 Dinh JE, Lord RG, Gardner WL, Meuser JD, Liden RC, Hu J. Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. Leadersh Q. 2014;25:36–62.
10 Dionne SD, Gupta A, Sotak KL, et al. A 25-year perspective on levels of analysis in leadership research. Leadersh Q. 2014;25:6–35.
11 Yammarino FJ, Salas E, Serban A, Shirreffs K, Shuffler ML. Collectivistic leadership approaches: Putting the "we" in leadership science and practice. Ind Organ Psychol. 2012;5:382–402.
12 Cullen-Lester KL, Yammarino FJ. Collective and network approaches to leadership: Special issue collection. Leadersh Q. 2016;27:173–180.
13 Slocum D. Six creative leadership lessons from the military in an era of VUCA and COIN. Forbes.com. October 8, 2013. http://www.forbes.com/sites/berlinschoolofcreativeleadership/2013/10/08/six-creative-leadership-lessons-from-the-military-in-an-era-of-vuca-and-coin/. Accessed August 31, 2016.
14 Mutch A. Organization theory and military metaphor: Time for a reappraisal? Organ. 2006;13:751–769.
15 Stimpson JP, Li T, Shiyanbola OO, Jacobson JJ. Financial sustainability of academic health centers: Identifying challenges and strategic responses. Acad Med. 2014;89:853–857.
16 Bolman LG, Gallos JG. Reframing Academic Leadership. San Francisco, CA: Jossey-Bass; 2011.
17 Morgan G. Images of Organization. Thousand Oaks, CA: Sage Publications; 2006.
18 Zimmerman B, Lindberg C, Plsek P. A complexity science primer: What is complexity science and why should I learn about it? In: Zimmerman B, Lindberg C, Plsek P, eds. Edge Ware: Lessons From Complexity Science for Health Care Leaders. Irving, TX: VHA Inc.; 2008.
19 Mintzberg H. Structure in 5's: A synthesis of research on organization design. Manage Sci. 1980;26:322–341.
20 Lieff SJ, Albert M. The mindsets of medical education leaders: How do they conceive of their work? Acad Med. 2010;85:57–62.
21 Campbell J. The Hero With a Thousand Faces. 3rd ed. Princeton, NJ: Princeton University Press; 1968.
22 McCrimmon M. Is heroic leadership all bad? Ivey Bus J. January/February 2010. http://iveybusinessjournal.com/publication/is-heroic-leadership-all-bad/. Accessed August 31, 2016.
23 House RJ, Shamir B. Toward the integration of transformational, charismatic, and visionary theories. In: Chemers MM, Ayman R, eds. Leadership Theory and Research: Perspectives and Directions. San Diego, CA: Academic Press; 1993:81–108.
24 Bass BM, Riggio R. Transformational Leadership Second Edition. Mahwah, NJ: Lawrence Erlbaum Associates; 2006.
25 Kotter JP. Leading change: Why transformation efforts fail. Harv Bus Rev. 1995;73:59–67.
26 Loeser H, O'Sullivan P, Irby DM. Leadership lessons from curricular change at the University of California, San Francisco, School of Medicine. Acad Med. 2007;82:324–330.
27 Streiffer RH. Change is good—You go first! Using Kotter's 8 step process to understand change at CCHS. Poster presentation at: Association of American Medical Colleges Annual Meeting; November 2–5, 2013; Philadelphia, PA. http://www.cfar.com/sites/default/files/events/AAMC_Geiben_2013_Change_is_Good.pdf. Accessed August 31, 2016.
28 Montoya RM, Purvin DM, Pittinsy TL, Rosenthal SA. National Leadership Index 2007: A National Study of Confidence in Leadership. Cambridge, MA: Centre for Public Leadership, Harvard Kennedy School; 2007.
29 Gardner WL, Cogliser CC, Davis KM, Dickens M. Authentic leadership: A review of the literature and research agenda. Leadersh Q. 2011;22:1120–1145.
30 Neider LL, Schriesheim CA. The authentic leadership inventory (ALI): Development and empirical tests. Leadersh Q. 2011;22:1146–1164.
31 George B, Sims P, McLean AN, Mayer D. Discovering your authentic leadership. Harv Bus Rev. 2007;85:129–130, 132.
32 Ibarra H. The authenticity paradox. Harv Bus Rev. 2015;93:53–59.
33 Souba W. Health care transformation begins with you. Acad Med. 2015;90:139–142.
34 Wong CA, Cummings GG. The influence of authentic leadership behaviours on trust and work outcomes of healthcare staff. J Leadersh Stud. 2009;3:6–23.
35 Souba WW, Day DV. Leadership values in academic medicine. Acad Med. 2006;81:20–26.
36 Jensen SM, Luthans F. Entrepreneurs as authentic leaders: Impact on employees attitudes. Leadersh Organ Dev. 2006;27:646–666.
37 Clapp-Smith R, Vogelgesang GR, Avey JB. Authentic leadership and positive psychological capital: The mediating role of trust at the group level of analysis. J Leadersh Organ Stud. 2009;15:227–240.
38 Ladkin D, Spiller C. Authentic Leadership: Clashes, Convergences and Coalescences. Cheltenham, UK: Edward Elgar; 2013.
39 Manz CC, Neck CP. Mastering Self-Leadership: Empowering Yourself for Personal Excellence. 3rd ed. Upper Saddle River, NJ: Pearson Prentice-Hall; 2004.
40 Neck CP, Houghton JD. Two decade of self-leadership theory and research: Past developments, present trends, and future possibilities. J Manag Psychol. 2006;21:270–295.
41 Feser D, Mayol F, Srinivasan R. Decoding leadership: What really matters. McKinsey Q. 2014;4:88–91.
42 Lieff S, Banack JG, Baker L, et al. Understanding the needs of department chairs in academic medicine. Acad Med. 2013;88:960–966.
43 Manz CC, Sims HP. New Superleadership: Leading Others to Lead Themselves. San Francisco, CA: Berrett-Koehler; 2001.
44 Holroyd J. Self-Leadership and Personal Resilience in Health and Social Care. Thousand Oaks, CA: Sage Publications; 2015.
45 Pearce CL, Wassenaar CL. Leadership is like fine wine: It is meant to be shared, globally. Organ Dyn. 2014;43:9–16.
46 Pearce CL, Manz CC, Sims HP. Share, Don't Take the Lead: Leadership Lessons From 21 Vanguard Organizations. Charlotte, NC: IAP; 2014.
47 Brater DC. Viewpoint: Infusing professionalism into a school of medicine: Perspectives from the dean. Acad Med. 2007;82:1094–1097.
48 Pearce CL. The future of leadership: Combining vertical and shared leadership to transform knowledge work. Acad Manage J. 2004;18:47–57.
49 Michael D, Kocolowski MD. Shared leadership: Is it time for a change? Emerg Leadersh Journeys. 2010;3:22–32.
50 Balkundi P, Kilduff M. The ties that lead: A social network approach to leadership. Leadersh Q. 2006;16:941–962.
51 Harvard Kennedy School. What does "social capital" mean? http://www.hks.harvard.edu/programs/saguaro/about-social-capital/faqs#definition. Accessed August 31, 2016.
52 Battilana J, Casciaro T. The network secrets of great change agents. Harv Bus Rev. 2013;91:62–68, 132.

53 Ibarra H, Hunter M. How leaders create and use networks. Harv Bus Rev. 2007;85:40–47, 124.
54 Lieff S, Albert M. What do we do? Practices and learning strategies of medical education leaders. Med Teach. 2012;34:312–319.
55 Holley J. The Network Weaver Handbook. Athens, OH: Network Weaver; 2012.
56 Westley F, Zimmerman B, Patton MQ. Getting to Maybe: How the World Is Changed. Toronto, Ontario, Canada: Vintage Canada; 2007.
57 Cullen K, Willburn P, Chrobot-Mason D, Palus C. Networks: How Collective Leadership Really Works. Greensboro, NC: Centre for Creative Leadership; 2014. http://insights.ccl.org/wp-content/uploads/2015/04/networksHowCollective.pdf. Accessed August 31, 2016.
58 Mallon WT, Grigsby RK; Association of American Medical Colleges. Leading: Top Skills, Attributes, and Behaviors Critical for Success. AAMC Successful Medical School Department Chair Series. Washington, DC: American Association of Medical Colleges; 2016.