Commentary

Evidence as a tool for managerial action: A complex adaptive systems view

Evidence-based management (EBM) is based on the idea that managers should adopt practices that scientific inquiry has shown to be effective. The evidence produced from scientific inquiry contributes to the body of knowledge that informs the management practices advocated by EBM. This evidence is generally seen as a solution for a problem faced by managers. Arndt and Bigelow (2009) pointed to three underlying assumptions of EBM: (a) Decisions based on evidence will yield anticipated results, (b) results from EBM will be generalizable across organizations, and (c) evidence is objective and independent of context. Arndt and Bigelow showed that these assumptions do not hold for modern health care organizations because unexpected outcomes are frequent, initial conditions are unknowable, and locality is paramount. Following this logic, it is then reasonable to say that evidence generated from management studies may not, in fact, provide solutions to the problems that managers face.

Critical reflection on how managers of health care organizations should use evidence from management studies is needed. The solution to the challenge of how to use evidence from management research in health care is not to simply throw it out and rely on logical analysis unsupported by empirical evidence or on myth or superstition. Rather, the solution exists in our capacity to think carefully about the fundamental nature of available research evidence and the fundamental nature of health care organizations and in our ability to help health care managers take locally relevant, evidence-informed action. In this essay, we extend the argument made by Arndt and

Bigelow (2009) by proposing an alternative way to think about the evidence generated by management research. EBM is generally conceptualized as a way to apply a standard course of action to a common, presumably recurring problem. Complex adaptive systems theory leads us to believe that, regardless of the number of apparent similarities across systems, small or unrecognized differences in the relationships among variables, unknowable unintended consequences of action, and seemingly inconsequential differences in initial conditions can make standard responses to a common problem ineffective. We suggest that rather than thinking about evidence as a solution to be applied to a common problem, managers in health care organizations should think about evidence as a tool for locally relevant managerial action. Specifically, evidence should be used as a seed for informed conversation, a guide for local action, and a strategy for learning.

Evidence as a Seed for Informed Conversation

Facilitating meaningful conversation in health care organizations is often difficult, but it is important for making effective change (Jordan et al., 2009). Rather than applying evidence as indicated per an EBM model of organizational change, health care managers should rely on evidence to start creative, locally relevant dialogue. Evidence from management research should be used to open the door to new conversations that can be used to propel organizations along positive paths of managerial action.

Topics of conversation will vary depending on the particular situation and the problem being addressed. Conversation could be focused on the question the organization is facing, the actions the organization is currently taking, and/or the actions the organization has taken in the past. These topics, as well as evidence from scientific inquiry, should inform future managerial action.

Reuben R. McDaniel Jr., EdD, is Charles and Elizabeth Prothro Regents Chair in Health Care Management, McCombs School of Business, The University of Texas at Austin. E-mail: reuben.mcdaniel@mccombs.utexas.edu.

Holly Jordan Lanham, MBA, is PhD Candidate, McCombs School of Business, The University of Texas at Austin. E-mail: holly.lanham@phd.mccombs.utexas.edu.

For conversation to be profitable, managers must learn to effectively engage diversity—that is, consider different points of view that various stakeholders bring to the table. Complex adaptive systems are made up of diverse agents (Cilliers, 1998). Diversity among agents is a source of novelty (Beinhocker, 2006; Capra, 2002) and a resource for problem solving (McDaniel and Walls, 1997). Some of the diverse thinking that is required for effective conversation will come from the evidence generated by managerial research. Other diversity should come from the differences in perspectives held by health care managers and professionals involved in the conversation.

Managers should resist the temptation to foster a climate of consensus as tension and conflict can be sources of creativity. One way to seed informed conversation with diverse points of view is to ask individuals to discuss issues at hand in the context of research articles providing contradictory evidence. In addition, managers could use multiple sources of research evidence, that is, systematic studies, exploratory case studies, and industry reports, to seed conversation for informed local action.

Evidence as a Guide for Local Action

Rather than viewing evidence as a solution to a problem, complex adaptive systems theory suggests that one views evidence as a guide for local action. Given the dynamic and unpredictable nature of health care organizations, managers would benefit from taking small actions and then deliberately and consciously looking to see what happens after taking action (Arthur, 1999). An act-then-look approach may be particularly helpful in environments that are highly ambiguous and uncertain (McDaniel, Lanham, & Anderson, 2009). This kind of approach could help health care managers view action as a series of tentative solutions as opposed to a set solution.

Experiments and pilot studies may be particularly salient as managers look for ways to use evidence as a guide for local action in health care organizations. Experiments and pilot studies could be conducted simultaneously or in parallel—depending on the question(s) being asked. Evidence from scientific inquiry should be used to design experiments and pilot studies, help managers evaluate results, and help identify ways to extend insights beyond the original evidence. In one sense, using evidence as a guide for local action is similar to a Bayesian approach—that is, one's beliefs about a phenomenon are updated as new information (evidence) becomes available. Using Bayesian theory in a strict sense might restrict one's use of the ideas to highly quantitative, probabilistic problems, but using it as an approach to thinking about dynamic situations can open the door to creative local action.

Managers should use local action to create real-time information about their organization. They must also recognize that a given local action may or may not represent the "ideal" action suggested by an EBM model. Managers should work to find ways to include the results from local action and the results from scientific evidence in their thinking about future action. Local experiments and pilot studies should test out solutions that others have tried in other settings and should not be conducted based on myth or superstition. Experiments and pilot studies should use scientific evidence as a guide for local managerial action.

Evidence as a Strategy for Learning

Rather than viewing evidence as knowledge about a solution, health care managers should view evidence as knowledge that could be used as a foundation for learning. The latter view treats evidence as a strategy for enabling learning about local organizations. Well-informed and knowledgeable managers are better able to learn about work as it unfolds. One source of the knowledge on which to build learning is evidence about effective practice in similar circumstances. Because health care organizations are complex adaptive systems, it is unlikely that what happens in one organization will happen in another. Thus, learning from samples of one (March, Sproull, & Tamuz, 1991) can be an effective strategy for making EBM relevant in health care. EBM studies can be seen as ways of simulating experience, as hypothetical histories that can be used to construct models that can serve to facilitate sense making of present situations.

Managers must use current evidence in designing effective action and then pay attention to and learn from what happens locally after action is taken. Managers should resist the temptation to assume that findings from management research will apply in their organization. If conceptualized as a source of information, evidence can be used as a strategy for learning.

Making EBM Relevant in Health Care

Health care organizations are complex adaptive systems that operate in ambiguous and dynamic environments (McDaniel & Driebe, 2001). EBM is often based on a set of traditional management ideas that views organizations as mechanistic entities that operate in fairly predictable and stable environments. Thus, it seems that there is a fundamental mismatch between the nature of health care organizations and EBM that would deem EBM useless in health care. In this essay, we suggest that this is not the case and that EBM can be highly relevant in the management of health care organizations.

We take issue with a suggestion made by Arndt and Bigelow (2009). Their call for empirical research studying the diffusion of EBM in health care organizations and comparing the results achieved by organizations that use EBM practices with those that do not seems contradictory to the central argument of their paper. Collecting evidence about the use of EBM in health care organizations will likely have the same weaknesses that the authors suggest are present in existing EBM studies. Thus, this suggestion may not be as helpful to managers of health care

organizations and/or as forward thinking as the authors originally imagined.

If we can, however, take a step back and force ourselves to look critically at the challenges of using EBM in health care, then we can generate more effective models for making EBM relevant to health care. A view from complex adaptive systems theory helps us identify ways in which research evidence can be used by health care organizations—although each organization is unique and exists in a dynamic environment. We suggest the use of scientific evidence as a tool for seeding informed conversation, guiding local action, and learning about local organizations. Thinking about evidence from management research within this frame allows one to see evidence as a tool for locally relevant managerial action.

Reuben R. McDaniel Jr., EdD
Holly Jordan Lanham, MBA

References

Arndt, M., & Bigelow, B. (2009). Evidence-based management in health care organizations: A cautionary note. *Health Care Management Review*, *34*(3), 206–213.

Arthur, W. B. (1999). Complexity and the economy. *Science*, *284*, 107–109.

Beinhocker, E. D. (2006). *The origin of wealth: Evolution, complexity, and the radical making of economics*. Boston: Harvard Business School Press.

Capra, F. (2002). *The hidden connections*. New York: Doubleday.

Cilliers, P. (1998). *Complexity and postmodernism: Understanding complex systems*. New York: Routledge.

Jordan, M. E., Lanham, H. J., Crabtree, B. F., Nutting, P. A., Miller, W. L., Stange, K. C., et al. (2009). The role of conversation in health care interventions: Enabling sensemaking and learning. *Implementation Science*, *4*, 15.

March, J. G., Sproull, L. S., & Tamuz, M. (1991). Learning from samples of one or fewer. *Organization Science*, *2*, 1–13.

McDaniel, R. R. Jr., & Driebe, D. J. (2001). Complexity science and health care management. In Blair, J. D., Fottler, M. D. & Savage, G. T. (Eds.), *Advances in health care management* (vol. 2, pp. 11–36). Stamford, CN: JAI Press.

McDaniel, R. R. Jr., Lanham, H. J., & Anderson, R. A. (2009). Implications of complex adaptive systems theory for the design of research on health care organizations. *Health Care Management Review*, *34*(2), 191–199.

McDaniel, R. R. Jr., & Walls, M. E. (1997). Diversity as a management strategy for organizations: A view through the lenses of chaos and quantum theories. *Journal of Management Inquiry*, *6*, 371–383.