

Learning healthcare systems: a perspective from the US

Andrew B Bindman^{a,b}

^a Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco, US

^b Corresponding author: andrew.bindman@ucsf.edu

Article history

Publication date: September 2019

Citation: Bindman AB. Learning healthcare systems: a perspective from the US. *Public Health Res Pract.* 2019;29(3):e2931920. <https://doi.org/10.17061/phrp2931920>

Key points

- New payment models in the US that hold clinicians accountable for cost and quality are contributing to a rising demand for evidence, and a transformation of healthcare organisations into learning healthcare systems
- Healthcare organisations are becoming learning healthcare systems by playing roles as: 1) evidence generators; 2) evidence curators; 3) evidence adopters; 4) evidence disseminators; and 5) evidence managers
- The pace at which healthcare organisations will fully transform into learning healthcare systems will depend on the availability of internal and external resources, and the external pressures on them to be accountable for managing the cost and quality of their patient care

Abstract

Changes under way in the healthcare environment have the potential to accelerate the pace at which evidence is incorporated into practice. Motivated by new payment models that hold clinicians accountable for cost and quality, healthcare organisations in the US are developing their capacity to become learning healthcare systems that are able to generate, adopt and apply evidence to support quality improvement and high-value care. The pace at which healthcare organisations will make progress will depend on whether they perceive a return on their investments, the availability of internal and external resources to help them make this transformation, and the external pressures on them to be accountable for managing the cost and quality of their patient care.

Background

The use of research evidence to drive innovation and improvements in healthcare has never been greater. Yet studies consistently show gaps between optimal care as determined by research evidence and actual practice.¹

There is no systematic process in the US for moving research knowledge into practice. As a result, patients can be deprived of potentially beneficial approaches to treatment, and the differential rates of dissemination among clinicians who care for patients with different social characteristics may contribute to healthcare disparities. Federal agencies in the US have increased their funding support for dissemination and implementation², but the responsibility for this task is still primarily left to private interests.

Changes under way in the healthcare environment have the potential to accelerate the pace at which evidence is incorporated into practice. One major trend is the consolidation of physicians and hospitals into healthcare systems. In the US, 44.6% of physicians were a part of a health system in 2016, including 42.7% of primary care physicians.³ When physicians join together into organised groups, they have the potential to pool resources to invest in information systems that are capable of generating knowledge from a shared group of patients. These information systems can also support care management tools to promote the uptake of this knowledge into practice.

New payment models in the US that hold clinicians accountable for cost and quality are also contributing to a rising demand for evidence and a transformation of healthcare organisations into learning healthcare systems. A learning healthcare system is an ecosystem in which all stakeholders (clinicians, patients, managers, researchers and others) can contribute, share and analyse data, and where continuous learning cycles encourage the creation of new knowledge that can be used by a variety of health information systems.⁴ A central aspect of a learning healthcare system is that the organisation's internal data and experience are systematically captured and integrated with external evidence to create knowledge that is put into practice.⁵

Learning healthcare systems

The pathway for a healthcare organisation to become a learning healthcare system is uncharted territory. Provider organisations vary in how they are approaching the systematic use of evidence in the care of patients, and some are further along in doing so than others. Based on interviews conducted with leaders at healthcare organisations considered to be at the forefront of this effort in the US, I have identified at least five ways in which they are systematically engaging with evidence.⁶ Healthcare organisations are becoming learning healthcare systems by playing roles as: 1) evidence generators; 2) evidence curators; 3) evidence adopters; 4) evidence disseminators; and 5) evidence managers.

Evidence generators

Some healthcare organisations, such as academic practices, have a history of employing individuals who conduct research to generate new knowledge to inform practice. Until recently, this research may or may not have been focused on the patient population where the investigator was employed. A change now under way is that organisations are paying researchers to focus their attention on their own healthcare delivery system. In most cases, these in-house funded researchers are developing research questions informed by experiences of being embedded within a clinical service area, such as cardiology, and by the expressed priorities of senior managers within the healthcare organisation. The projects that tend to gain the most traction are those that clinical service leaders and health system managers prioritise as meaningful, and researchers regard as innovative. These projects may begin with resources available from the health system and expand with the availability of extramural funds.

Support for embedded researchers within healthcare systems comes on the heels of major investments by these organisations into developing electronic health records. The use of computers and electronic data is not entirely new, but what had initially been a collection of isolated electronic data systems for some organisations

is rapidly becoming a single integrated system built on a common platform across different levels and sites of care. This supports care management across different levels of service, and gives researchers an opportunity to identify patient groups, characterise care patterns across levels of service, evaluate costs and determine health outcomes. Analysis of the observational data remains a somewhat labour-intensive activity at this point, with little in the way of standardised reporting tools within or across health systems.

In some healthcare organisations, there is a developing capacity to not only analyse the observational data, but to conduct experiments (pragmatic trials) or quasi-experiments (step-wedge evaluation) in which the information system is often the backbone of assigning patients to different intervention arms and may be used to collect outcomes on clinical events such as hospitalisations.⁷ Recognising the potential power of this information – not only for individual patient care but for population health management – healthcare organisations are seeking ways to generate knowledge from their data systems that can inform quality improvement and cost-efficient delivery of services.

Evidence curators

Separate from their role as evidence generators, some healthcare organisations are taking responsibility for curating evidence in the published literature. Historically, this is something an individual or a group of physicians was assumed to be doing to maintain their clinical expertise. However, healthcare organisations are stepping into this role, partly because they perceive that their clinicians are overwhelmed by attempts to stay on top of the rapidly accumulating knowledge base. Healthcare organisations are employing staff with expertise in identifying and systematically summarising research literature on clinical topics. This may be done in response to requests from clinical leaders within the organisation or as a part of periodic surveillance of published research to identify potential treatment approaches that would be discussed with the appropriate clinical leaders to determine their relevance for the organisation's practices.⁸ Organisations that also have a role as an insurer may use evidence curation to address requests by patients and clinicians for coverage for a treatment that is not already determined as a covered benefit within a health plan.

Evidence adopters

Based on knowledge generated within the health system or curated from evidence generated elsewhere, some healthcare organisations are taking the additional step of systematically adopting evidence at an organisational level. One way they are doing this is by creating system-wide guidelines for clinical practices for which there is available evidence. This is a new role for healthcare organisations, which have generally left the choice and use of practice guidelines to individual clinicians.

Clinicians have tended to make use of practice guidelines produced by their own specialty. This can sometimes result in inconsistent guidelines being followed for the same clinical problem across different specialties within an organisation. When organisations attempt to establish system-wide guidelines, they bring together clinical leaders from involved specialties and engage them in a discussion of the evidence to establish consensus on practice recommendations applicable to all clinicians within the organisation. Evidence-based guidelines that are established at an organisational level have the potential to harmonise differences across specialties, and thereby reduce variation in practice that does not contribute to high-quality care.

Another way in which organisations are supporting the adoption of evidence is by providing their clinicians with information about their practice variation.⁹ This is typically done within a clinical service area, with a focus on a common clinical practice or a set of common practices within the subgroup of relevant clinicians. In some cases, organisations are not only providing the data to various groups of clinicians, but are financially rewarding them for reviewing and discussing the results with their colleagues on a periodic basis. This is an opportunity for peers to review the data on their own practice, to consider the relevant evidence, and to provide feedback that can contribute to adoption of evidence-based practices and a reduction in practice variation that does not contribute to quality care.

Evidence disseminators

In addition to providing guidelines and data to support evidence-based practice, some healthcare organisations are actively promoting the use of evidence through clinical decision support (CDS) and provider payment incentives. When used, CDS is typically integrated into electronic health record systems and is prompted when clinicians are making relevant diagnostic, testing or treatment decisions. For example, an organisation might embed CDS within its electronic health record system to encourage evidence-based strategies at the time a clinician is using the electronic health record system to order an imaging study. CDS can be implemented as a purely informational tool, or to place requirements on clinicians to take additional steps if they wish to pursue a testing or treatment approach that does not conform to what is recommended by the CDS system.

Organisations that have a financial interest in managing costs for a population of patients may go a step further by tying financial incentives, such as payment bonuses or opportunities for shared savings with clinicians, based on their efficient management of resources as well as adherence to evidence-based quality metrics. An important part of the strategy is aligning the financial incentives across various payers (e.g. Medicare, Medicaid, commercial insurers) so that

clinicians within the organisation can apply evidence in a consistent fashion.

Evidence managers

Some organisations that have a financial interest in managing costs for a population of patients are also applying evidence outside the care setting. One such application is in purchasing decisions for supplies and equipment, where evidence on effectiveness and cost can be considered as a way to choose among options to maximise value. In cases in which healthcare organisations are not accountable for their costs, the choice of medical equipment is often left to the clinicians who use the equipment. For example, different surgeons at the same healthcare organisation who perform joint replacements may choose to use different medical devices. They may be influenced more by their experience with particular devices than by evidence on comparative effectiveness and costs of the various options. Healthcare organisations that are accountable for their costs are in a position to review evidence on the effectiveness of the various options, to discuss the evidence and implications of any limits on purchasing choices with affected clinicians to ensure that quality is not compromised, and to use their purchasing power to obtain the best value for their patient population.

Conclusion

Healthcare organisations in the US are developing their capacity to become learning healthcare systems that are able to generate, adopt and apply evidence to support quality improvement and high-value care. However, they face competing demands for their attention and resources. The pace at which healthcare organisations will make progress in generating and applying evidence will depend on whether they perceive a return on their investments in becoming a learning healthcare system, the availability of internal and external resources to help them make this transformation, and the external pressures on them to be accountable for managing the cost and quality of their patient care. Performance metrics that would allow them to evaluate their progress over time and to benchmark it against other healthcare organisations may be valuable for self-monitoring and planning. Public investment in supporting health systems to generate new knowledge should include requirements to ensure that learning is shared publicly, so as to offer a benefit for all.¹⁰

Acknowledgements

This project was funded while ABB was working under Intergovernmental Personnel Act assignment with the Agency for Healthcare Research and Quality, US Department of Health and Human Services. ABB is responsible for its content. Statements in the report should not be construed as endorsement by the

Agency for Healthcare Research and Quality or the US Department of Health and Human Services.

This paper draws substantially upon material published in a report of the Agency for Healthcare Research Quality.⁶ ABB received support from the Sax Institute to attend the 2018 Knowledge Mobilisation conference to discuss the topic of this paper.

Peer review and provenance

Externally peer reviewed, invited.

Competing interests

None declared.

Author contributions

ABB is the sole author, and was responsible for conceiving and writing the manuscript.

References

1. Levine DM, Linder JA, Landon BE. The quality of outpatient care delivered to adults in the United States 2002 to 2013. *JAMA Intern Med.* 2016;176(12):1778–90.
2. Purtle J, Peters R, Brownson RC. A review of policy dissemination and implementation research funded by the National Institutes of Health, 2007–2014. *Implement Sci.* 2016;11(1).
3. Agency for Healthcare Research and Quality. Comparative health system performance initiative: snapshot of US health systems, 2016. Rockville, MD: AHRQ; September 2017 [cited 2019 Aug 9]. Available from: www.ahrq.gov/sites/default/files/wysiwyg/snapshot-of-us-health-systems-2016v2.pdf
4. Krumholz HM, Terry SF, Waldstreicher J. Data acquisition, curation, and use for a continuously learning health system. *JAMA.* 2016;316(16):1669–70.
5. Agency for Healthcare Research and Quality. Learning Health Systems. Rockville, MD: AHRQ [cited 2019 Aug 9]. Available from: www.ahrq.gov/professionals/systems/learning-health-systems/index.html
6. Bindman A. How learning health systems learn: lessons from the field. AHRQ Publication No. 19-0047. Rockville, MD: Agency for Healthcare Research and Quality; April 2019 [cited 2019 Apr 20]. Available from: www.ahrq.gov/sites/default/files/wysiwyg/lhs/how_learning_health_systems_learn.pdf
7. Lewis RJ. The pragmatic clinical trial in a learning health care system. *Clin Trials.* 2016;13(5):484–92.
8. Schottinger J, Whittaker J, Kanter MH. A model for implementing evidence-based practice more quickly. *NEJM Catalyst.* Waltham, MA: Massachusetts Medical Society; 2017 [cited 2019 Aug 9]. Available from: catalyst.nejm.org/implementing-evidence-based-practices-quickly/
9. Weilburg JB, Siström CL, Rosenthal DI, Stout MB, Dreyer KJ, Rockett HR, et al. Utilization management of high-cost imaging in an outpatient setting in a large stable patient and provider cohort over 7 years. *Radiology.* 2017;284(3):766–76.
10. Bindman AB, Pronovost PJ, Asch DA. Funding innovation in a learning health care system. *JAMA.* 2018;319(2):119–20.

Copyright: 

© 2019 Bindman. This article is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Licence, which allows others to redistribute, adapt and share this work non-commercially provided they attribute the work and any adapted version of it is distributed under the same Creative Commons licence terms. See: www.creativecommons.org/licenses/by-nc-sa/4.0/