

Testimony of

**Steven R. Simon, MD, MPH, FACP**

Joint Oversight Hearing on  
Advanced Technologies in Healthcare

Joint Committee on Health Care Financing and Joint Committee on Economic  
Development and Emerging Technologies' Joint Oversight Hearing on Advanced  
Technologies in Healthcare

The Commonwealth of Massachusetts

May 5, 2005

Senators Moore and Hart, Representatives Walrath and Bosley, distinguished Committee Members: thank you for the invitation to speak with you today about the role of health information technology in improving the quality and safety of health care.

I am an assistant professor of ambulatory care and prevention at Harvard Pilgrim Health Care and Harvard Medical School, where I do research related to the interface of medical education and health information technology, specifically on interventions to improve the safety and quality of health care. I am a board-certified internist, and I practice primary care general internal medicine at Harvard Vanguard Medical Associates. I am also the father of three small children, who are thankfully very healthy, but who, like most of us, are fortunate enough to engage frequently with the health care system for episodic and preventive health care. It is with these perspectives that I am delighted to speak with you today about the value of health information technology in improving the quality and safety of health care. Because of time constraints, my remarks will focus on the value of electronic health records, or EHRs, in the ambulatory practice setting, the widespread adoption and implementation of which will transform the nature of health care delivery as we know it – for the better. I will not discuss other technologies, such as computerized provider order entry (CPOE) and regional health information infrastructures, in any detail, but suffice it to say that the integration of all these and other technologies will have synergistic benefits in a variety of sectors and dimensions of the health care system.

The problems of quality and safety in health care have been well described and are too numerous to describe in any detail here.<sup>1-8</sup> These problems frequently relate to

insufficient, inadequate, or wrong information being available for clinical decision-making. They result in patients, both in hospitals and the outpatient setting, receiving care that results in harm or not receiving care that would be considered appropriate or even necessary.

Based on a broad foundation of evidence, the Institute of Medicine, among other professional, governmental and academic institutions, has advocated for the wide-scale implementation of EHRs as the most important health care intervention to improve patient safety and health care quality.<sup>1-8</sup> EHRs can help improve communication among providers, patients, and payers and can help to decrease administrative burdens. With sophisticated decision support systems, EHRs can contribute to a decrease in costs and an improvement in quality by suggesting cost-efficient approaches and alternatives, identifying errors, emphasizing important abnormalities, and making guidelines readily accessible. Those on the frontlines of healthcare recognize these potential benefits: The Medical Record Institute Survey found that clinicians' main interest in EHRs is to achieve improvements in efficiency and patient care quality.<sup>9</sup>

A host of studies has shown that electronic health records with built-in clinical decision support systems can reduce errors, resulting in better patient care.<sup>10-15</sup> Health maintenance and disease management rules integrated into the EHR remind physicians of patients who are due for tests and alert physicians about outstanding results, ensuring that important results are not lost and are acted upon. Evidence-based guidelines can assist physicians in providing optimal care for chronic diseases, and clinical hints will suggest best practices.<sup>16</sup> A crucial patient safety benefit arises from

the use of computerized prescribing, which allows default dosing, allergy information and drug/drug interactions among other features.<sup>11,17-22</sup> The central importance of this benefit cannot be overstated, as medication errors make up a large percentage of avoidable problems in safety and quality. An EHR contributes to improved clinical data capture and provides the ability to aggregate data across patients, making it an excellent quality assurance tool by providing better information about performance.

Time and place independence of record availability contributes enormously to improved continuity and integrity of care. Electronic connections between physicians' EHRs and other health care organizations lead to improved physician-to-physician communication especially around referrals to specialists, who typically lack access to important patient information in paper systems, and also facilitates primary care physicians' receiving information back from specialists.<sup>22</sup> In addition, electronic access to data from health care organizations such as commercial laboratories and pharmacies can provide much needed information at the point-of-care. With the advent of community data exchange, the potential for increased efficiencies, improved quality care, and cost savings is greatly enhanced. Better communication will result in improved safety, quality and efficiency.<sup>23-25</sup>

Electronic recording, storage, and exchange of patient information have the potential to save time and money for providers and payers alike.<sup>26,27</sup> For providers, the financial benefits fall into two main categories: operational efficiency and improved reimbursement. For those physicians working under capitated arrangements, medical cost savings will also directly benefit them. Operational efficiencies can be realized from systems that facilitate workflow improvements and clinical processes.<sup>26,27</sup> The EHR

streamlines awkward paper processes and eliminates duplicate data entry. The costs associated with maintaining, storing, transcribing, and retrieving paper records can be decreased. Improved reimbursement results from improved clinical documentation to support appropriate billing service levels. Electronic data exchange both between practices, and between practices and other health care organizations such as laboratories and pharmacies also create operational efficiencies. As for the payers, it has been demonstrated that changes in drug utilization due to EHR use can result in large savings for payers and capitated providers. Other savings result from decreased utilization of laboratory tests and radiology examinations, and reduction in inpatient admissions relating to ambulatory care sensitive conditions.<sup>28</sup> More accurate billing and coding by physicians result in lower claims-processing costs for the payer.

Fewer than 20% of U.S. physicians use electronic health records. Although many of the large practice groups and integrated delivery systems in the Commonwealth have adopted this technology, best estimates suggest that fewer than 10% of the physicians in office practice in Massachusetts use electronic health records. The greatest barrier to EHR adoption seems to be the lack of available capital. That is, although EHRs and related technology will ultimately be cost-saving for the practicing physician, the up-front capital expenditure is preventing most physicians, and hence most of the citizens of the Commonwealth, from benefiting from this technology.

In summary, strong research evidence supports the conclusion that electronic health records can improve the quality and safety of health care and will correspondingly reduce health care costs. To date, physicians in office practice have been unable to adopt this technology because of financial barriers. Widespread

adoption and implementation of EHRs should be of high priority for advancing the quality and safety of healthcare in Massachusetts.

## LITERATURE CITED

1. Institute of Medicine. Crossing the quality chasm: A new health system for the 21st century. 2001. Washington, D.C., National Academy Press.
2. McGlynn, E. A., Asch, S. M., Adams, J., Keesey, J. , Hicks, J., DeCristofaro, A., and Kerr, E. A. The quality of health care delivered to adults in the United States. *New England Journal of Medicine*. 348[26], 2635-2645. 6-26-2003.
3. Gandhi, T. K., Burstin, H. R., Cook, E. F., Puopolo, A. L., Haas, J. S., Brennan, T. A., and Bates, D. W. Drug complications in outpatients. *Journal of General Internal Medicine*. 15[3], 149-154. 2000.
4. Gandhi, T. K., Weingart, S. N., Borus, J., Seger, A. C., Peterson, J., Burdick, E. , Seger, D. L., Shu, K., Federico, F., Leape, L. L., and Bates, D. W. Adverse drug events in ambulatory care. *New England Journal of Medicine*. 348[16], 1556-1564. 4-17-2003.
5. Forster, A. J., Murff, H. J., Peterson, J. F., Gandhi, T. K., and Bates, D. W. The incidence and severity of adverse events affecting patients after discharge from the hospital. *Annals of Internal Medicine*. 138[3], 161-167. 2-4-2003.
6. Institute of Medicine. To err is human. Building a safer health system. Kohn, L. T., Corrigan, J. M., and Donaldson, M. S. 1999. Washington, D.C., National Academy Press.

7. Committee on Data Standards for Patient Safety, Institute of Medicine. Key Capabilities of an Electronic Health Record System. 9-15-2003. Washington, D.C., National Academy Press. 4-7-2004.
8. Bates, D. W., Ebell, M., Gotlieb, E., Zapp, J., and Mullins, H. C. A proposal for electronic medical records in U.S. primary care. Journal of the American Medical Informatics Association. 10[1], 1-10. 2003.
9. Medical Records Institute. Fifth Annual Medical Records Institute's Survey of Electronic Health Records Trends and Usage. Available at <http://www.medrecinst.com/uploadedFiles/resources/survey/surveyOverview03.pdf> . Accessed 4-7-2004.
10. Kaushal, R., Shojania, K. G., and Bates, D. W. Effects of computerized physician order entry and clinical decision support systems on medication safety: a systematic review. Archives of Internal Medicine. 163[12], 1409-1416. 6-23-2003.
11. McConnell, T. Safer, cheaper, smarter. Computerized physician order entry promises to streamline and improve healthcare delivery. Health Management Technology. 22[3], 16-18. 2001.
12. Bates, D. W. and Gawande, A. A. Improving safety with information technology. New England Journal of Medicine. 348[25], 2526-2534. 2003.
13. Chertow, G. M., Lee, J., Kuperman, G. J., Burdick, E., Horsky, J., Seger, D. L., Lee, R., Mekala, A., Song, J., Komaroff, A. L., and Bates, D. W. Guided

- medication dosing for inpatients with renal insufficiency. JAMA. 286[22], 2839-2844. 12-12-2001.
14. Hunt, D. L., Haynes, R. B., Hanna, S. E., and Smith, K. Effects of computer-based clinical decision support systems on physician performance and patient outcomes: a systematic review. JAMA. 280[15], 1339-1346. 10-21-1998.
  15. Raschke, R. A., Gollihare, B., Wunderlich, T. A., Guidry, J. R., Leibowitz, A. I., Peirce, J. C., Lemelson, L., Heisler, M. A., and Susong, C. A computer alert system to prevent injury from adverse drug events: development and evaluation in a community teaching hospital. JAMA. 280[15], 1317-1320. 10-21-1998.
  16. Lehmann, E. D. Electronic medical records in clinical diabetes care. Diabetes Technology & Therapeutics. 1[4], 555-557. 1999.
  17. Abookire, S. A., Teich, J. M., Sandige, H., Paterno, M. D., Martin, M. T., Kuperman, G. J., and Bates, D. W. Improving allergy alerting in a computerized physician order entry system. Proceedings / AMIA ...Annual Symposium. 2-6. 2000.
  18. Bates, D. W., Kuperman, G, and Teich, J. M. Computerized physician order entry and quality of care. Qual.Manag.Health Care 2(4), 18-27. 1994.
  19. Bates, D. W., Teich, J. M., Lee, J., Seger, D., Kuperman, G. J., Ma'Luf, N., Boyle, D., and Leape, L. The impact of computerized physician order entry on medication error prevention. Journal of the American Medical Informatics Association. 6[4], 313-321. 1999.

20. California Healthcare Foundation. The Quality Initiative: Computerized Physician Order Entry. Available at <http://admin.chcf.org/documents/quality/CPOEfactsheet.pdf>. 2002.
21. Gandhi, T. K., Weingart, S. N., Seger, A., Seger, D. S., Borus, J. S., Burdick, E. , Leape, L. L., and Bates, D. W. Does computerized prescribing help reduce medication errors and ADRs in the outpatient setting? *Formulary* 36[8], 613-614. 2001.
22. Gandhi, T. K., Weingart, S. N., Seger, A., Seger, D. S., Borus, J. S., Burdick, E. , Leape, L. L., and Bates, D. W. Impact of Basic Computerized Prescribing on Outpatient Medication Errors and Adverse Drug Events. *JGIM* 16[195]. 6-1-2001.
23. Overhage, J. M., Dexter, P. R., Perkins, S. M., Cordell, W. H., McGoff, J., McGrath, R., and McDonald, C. J. A randomized, controlled trial of clinical information shared from another institution. *Annals of Emergency Medicine*. 39[1], 14-23. 2002.
24. Overhage, J. M., Suico, J., and McDonald, C. J. Electronic laboratory reporting: barriers, solutions and findings. *Journal of Public Health Management & Practice*. 7[6], 60-66. 2001.
25. Brailer, D. J. Connection tops collection. Peer-to-peer technology lets caregivers access necessary data, upon request, without using a repository. *Health Management Technology*. 22[8], 28-29. 2001.

26. iHealthBeat. North Carolina practice saves with EMRs. Available at <http://ihealthbeat.org/members/basecontent.asp?oldcoll=547&contentid=25164&collectionid=546&program=1> . Accessed 12-22-2003.
27. iHealthBeat. California Practices Increase Efficiency with EMRs. Available at <http://ihealthbeat.org/members/basecontent.asp?contentid=25878&collectionid=547&program=1> . Accessed 12-22-2003.
28. Siegrist, R. B., Jr. and Kane, N. M. Exploring the relationship between inpatient hospital costs and quality of care. American Journal of Managed Care. 9, Spec-9. 2003.