Electronic Health Records Use: Overcoming Clinicians' Barriers to Change by Applying Systems Thinking to Improve Patient Care

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Abstract

Medical education interventions may succeed in facilitating knowledge acquisition, yet fail to change practices because providers experience barriers to change, including systems barriers. Adoption of electronic health records (EHRs) is expected to benefit clinicians and patients, as well as healthcare systems nationwide. This presentation will address the use of EHRs in typical clinical practice settings. It will illustrate how systems thinking can be used to identify barriers and establish effective interventions related to the adoption and meaningful use of EHRs.

Working under contract to the Centers for Medicare & Medicaid Services (CMS), Medscape Education developed an Internet-based educational curriculum that included a clinical practice assessment (CPA) to evaluate clinicians' knowledge, skills, attitudes, and barriers regarding the CMS EHR incentive programs. Assessment questions included a focus on eligibility to participate in EHR incentive programs, perceived benefits of EHR systems, and barriers to implementation of EHR systems. More than 3000 clinicians completed the CPA from 1/11 to 2/11, and more than 9000 clinicians completed additional assessments embedded in related continuing medical education (CME) activities from 4/11 to 2/12. Their responses were evaluated and analyzed by Medscape and CE Outcomes. Responses indicate that nearly half of all participants did not know if they met requirements for the incentive programs, and a number of perceived barriers to implementation were identified. This presentation will review selected outcomes from these assessments and discuss the implications of barriers to change that were identified.

Introduction and Background

- A 2011 systematic literature review focusing on EHRs showed operational, financial, and performance benefits for physicians and hospitals.[1]
- Despite anticipated advantages of EHR utilization, physicians have been slow to adopt this technology for many reasons, including lack of knowledge of the expected benefits.[2,3]
- Barriers to adopt EHR technologies may include systems barriers.
- In an effort to promote the widespread adoption and use of EHRs, the federal government passed the Health Information Technology for Economic and Clinical Health (HITECH) Act as part of the American Recovery and Reinvestment Act of 2009.
  — Under this legislation, certain physicians are considered "eligible professionals," eligible for financial incentives to adopt and meaningfully use EHR technologies.[4] These incentive programs, known as the Medicare and Medicaid EHR Incentive Programs, are being administered by CMS.

Table 1: Criteria for "Eligible Professionals"

Category	Qualified for Incentive Program
Profession	Doctor of medicine or osteopathy; pediatrician; dental surgeon or dentist; podiatrist; optometrist; chiropractor; nurse practitioner; certified nurse midwife; physician assistant
Practice type	Primary care or specialist
Practice setting	Not hospital based

- Encouraging participation in the Medicare and Medicaid Incentive Programs requires broad dissemination of information about these programs to healthcare professionals through a diverse array of platforms.
  — CMS selected Medscape, an accredited Internet CME provider with wide reach among healthcare professionals in the United States, as a way to reach clinicians with education focused on promoting awareness of the EHR incentive programs, as well as identifying barriers to and emphasizing the benefits of EHR use.
    ▪ This selection was based on prior empirical evidence that Medscape was highly used and well regarded by healthcare providers, and that this mechanism could address the key barriers and facilitators that had been identified by CMS.[5]
- Working under contract with CMS, and with the goal of promoting awareness of and participation in the HITECH Act incentive programs for adoption, implementation, and demonstration of meaningful use of EHRs, Medscape developed and collaborated with CE Outcomes to evaluate an educational curriculum designed to improve awareness and overcome barriers.

- This presentation will address the use of EHRs in typical clinical practice settings, as reported by physician participants in the educational curriculum.

Objectives

- Evaluate the assessment data from an educational curriculum in order to
  — Assess eligible professionals' awareness and likelihood of participation in the Medicare and Medicaid EHR Incentive Programs
  — Identify clinicians' perceptions of the benefits of EHR adoption
  — Identify common barriers among eligible professionals to successful EHR system implementation

Methods

- On January 10, 2011, a CME/CE-certified CPA (ie, baseline assessment) was posted online by Medscape for all Medscape members to access
  — Data from the baseline assessment were collected for analysis from 1/10/11 through 2/3/11
  — This CPA focused on assessing awareness of the Medicare and Medicaid EHR Incentive Programs, as well as identification of barriers and perceived benefits, to accelerate the adoption of EHRs and participation in the Medicare and Medicaid EHR Incentive Programs
- Results of the baseline analysis helped to shape subsequent activities in the educational curriculum
  — The first 7 activities in the curriculum posted on Medscape between 4/6/11 and 10/25/11
  — Data were collected from these activities between 4/6/11 and 2/15/12

Methods of Analysis

Baseline assessment
- Response data were examined for fit with the "eligible professional" target audience of the initiative and those who met criteria for an "eligible professional" were included in the analysis (Table 1).
- Responses from the eligible professionals were analyzed through the use of descriptive and inferential statistical tests to examine the aggregate target audience's baseline knowledge and awareness related to EHR systems, incentive programs, and meaningful use of EHRs, as well as to examine the impact of eligible professionals' characteristics on their knowledge of and participation in the EHR incentive programs (eg, profession, CMS region, self-assessed eligibility for incentive program participation).

Table 2: Sample Area of Specialization Comparison With Practice Setting Type

	Private practice		Rural health clinic		Federally qualified health center		Managed care organization	
	n	%	n	%	n	%	n	%
Doctor of medicine or osteopathy (not pediatrician)	2092	74.2%	76	38.6%	127	51.0%	53	64.6%
Pediatrician	257	9.1%	9	4.6%	19	7.6%	8	9.8%
Doctor of podiatry	40	1.4%	0	0.0%	1	0.4%	0	0.0%
Chiropractor	45	1.6%	1	0.5%	0	0.0%	0	0.0%
Nurse practitioner	386	13.7%	83	42.1%	76	30.5%	21	25.6%
Physician assistant	0	0.0%	28	14.2%	26	10.4%	0	0.0%
Total respondents	2820	100.0%	197	100.0%	249	100.0%	82	100%

- This presentation will address the use of EHRs in typical clinical practice settings, as reported by physician participants in the educational curriculum.
- An additional focus of the baseline data analysis was the identification of perceived barriers to and advantages of EHR adoption and incentive program participation.

Curriculum activities assessment
- Response data for the 7 educational activities were examined separately, and the participant samples for each activity were examined for fit with the specific target audience specifications for each activity and screened appropriately.
- The activity samples of participant physicians and other healthcare professionals were assessed regarding their eligibility to participate in EHR incentive programs, their current use of EHR systems, and/or their knowledge and awareness related to EHR systems, incentive programs, and meaningful use of EHRs.
- Descriptive and inferential analyses were performed to examine the data for each activity. Barriers to EHR adoption were categorized independently by researchers into 1 of 3 categories (system and practice, support and resources, or patient and quality of care); all discrepancies in categorization were resolved collaboratively by the researchers.

Results

- Over 28,000 Medscape members participated in the CPA between 1/10/11 and 2/3/11
  — Of these, 3348 were determined to be eligible professionals and were included in the baseline analysis; the majority of the sample consisted of physicians and nurse practitioners who were largely in private, solo, or small group practices
  — Participant demographics show a broad reach to diverse practice settings across the United States (Tables 2 and 3)
    ▪ This diversity also was reflected in the participants of the subsequent 7 educational activities

Table 3: Major CMS-Defined Region Where Respondent's Practice is Located

Region/States		n	%
A	(CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT)	812	24.3
B	(IL, IN, KY, MI, MN, OH, WI)	497	14.8
C	(AL, AR, CO, FL, GA, LA, MS, NM, NC, OK, PR, SC, TN, TX, VA, VI, WV)	1302	38.9
D	(AK, AS, AZ, CA, GU, HI, ID, IA, KS, MO, MT, NE, NV, ND, MP, OR, SD, UT, WA, WY)	737	22.0
Total respondents		3348	100.0

Figure 1: Knowledge of Eligibility

Certain healthcare providers referred to as "eligible professionals" can receive incentive payments under the HITECH Act. Do you qualify to receive these incentive payments? (n=2284)

	n	%
Yes	707	31.0
No	517	22.6
I don't know	1060	46.4
Total Respondents	2284	100.0

Figure 2: Likelihood of Participation

How likely are you to participate in the EHR incentive program? (n=1794)

	n	%
Extremely likely	747	41.6
Very likely	456	25.4
Somewhat likely	314	17.5
Unlikely	277	15.4
Total Respondents	1794	100.0

- Across the subsequent 7 educational activities, over 77,000 assessments were completed between 4/6/11 and 2/15/12
  — Of these, 9369 were determined to have been completed by eligible professionals, using Medscape member registry information to approximate the definition of eligible professionals who qualify for federal EHR incentive programs, and were included in the analysis of these activities
- Approximately 15% of eligible professionals who participated in the baseline CPA thought they were not eligible for the EHR incentive programs.
- Nearly half of the participants in one activity indicated that they did not know if they met requirements for the incentive programs. (Figure 1)
- However, two-thirds of participants in the same activity indicated they were extremely likely or very likely to participate in the EHR incentive programs. (Figure 2)
- Main perceived advantages related to EHR implementation include the ability to generate patient health records; better care coordination; reduced use of paper; decreased medication errors; and increased overall efficiency. (Figure 3)

- Most commonly indicated barriers to implementing EHR systems include systems factors (cost of purchasing, installing, and operating; disruption/interruption of practice during implementation; changes required in work procedures and habits; financing the start-up of the certified EHR system; and training clinicians and other staff). (Figure 4)

Figure 3: Perceived Advantages of EHR Implementation

Which of the following do you consider as important advantages to successful implementation? (select all that apply) (n=2693)

- Ability to generate patient health records: 75% (n=2016)
- Better care coordination: 70% (n=1871)
- Reduced use of paper: 68% (n=1821)
- Decreased medication errors: 66% (n=1774)
- Increased overall efficiency: 63% (n=1693)
- Improved patient communication/education: 50% (n=1333)
- Decreased administrative burden: 49% (n=1307)
- Long-term cost savings: 46% (n=1247)
- Improved clinical decision-making: 46% (n=1236)
- Improvement of important clinical outcomes: 44% (n=1195)
- Decreased disparities in care: 43% (n=1146)
- Increased patient satisfaction: 38% (n=1023)
- Increased privacy of health information: 33% (n=878)
- Increased time to spend with patients: 29% (n=782)
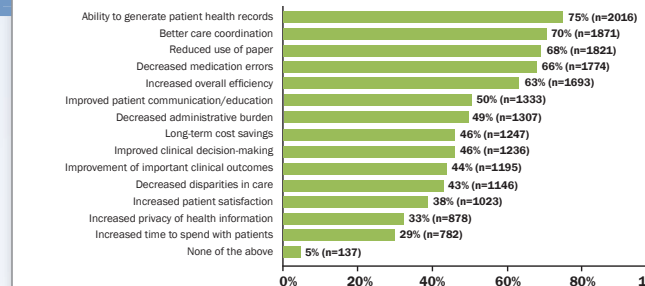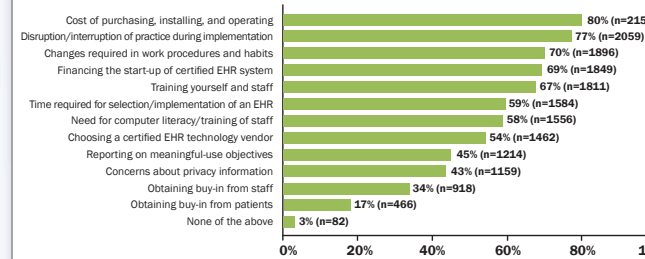- None of the above: 5% (n=137)

Figure 4: Perceived Barriers to EHR Implementation

You are outlining a plan implementing a certified EHR in your practice. Which of the following do you consider to be important barriers to successful implementation? (select all that apply) (n=2693)

- Cost of purchasing, installing, and operating: 80% (n=2152)
- Disruption/interruption of practice during implementation: 77% (n=2059)
- Changes required in work procedures and habits: 70% (n=1896)
- Financing the start-up of certified EHR system: 69% (n=1849)
- Training yourself and staff: 67% (n=1811)
- Time required for selection/implementation of an EHR: 59% (n=1584)
- Need for computer literacy/training of staff: 58% (n=1556)
- Choosing a certified EHR technology vendor: 54% (n=1462)
- Reporting on meaningful-use objectives: 45% (n=1214)
- Concerns about privacy information: 43% (n=1159)
- Obtaining buy-in from staff: 34% (n=918)
- Obtaining buy-in from patients: 17% (n=466)
- None of the above: 3% (n=82)

Discussion

- Web-based certified medical education is an effective method for reaching a large number of physicians and other healthcare professionals across the United States.
- Medical education interventions typically focus on knowledge acquisition, rather than change in practice. The current results demonstrate that education with a new focus on assessing awareness and likelihood of participating in the EHR incentive programs, and identifying perceived advantages as well as barriers to change, is effective.
- Advantages most often reported include the ability to generate patient health records; better care coordination; reduced use of paper; decreased medication errors; and increased overall efficiency.
- Most frequently identified barriers include cost of purchasing, installing, and operating the EHR system; disruption/interruption of practice during implementation; changes required in work procedures and habits; financing the start-up of certified EHR system; and training yourself and staff.
- Limitations
  — This study uses aggregated cohort data from each individual activity as well as the baseline assessment. Therefore, when evaluating data from the baseline assessment and data from an educational activity or activities, the individual cohorts may not include the same individual participants.
  — The samples for the baseline assessment and each subsequent educational activity within the curriculum consist of Medscape members who chose to participate in the CME/CE activity and complete the associated participant assessment surveys; thus, the samples are not random samplings of US healthcare professionals.

Conclusions

- CME is an effective addition to communication plans that must reach physicians for timely changes in practice, particularly in situations where barriers to change are present.
- Perceived advantages of EHRs were assessed and emphasized in Internet CME programs, to reach physicians most in need of change.
- Systems thinking was used to identify barriers to the adoption and meaningful use of EHRs. These barriers can be addressed in further educational programs.

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