



City Health Information

January 2007

The New York City Department of Health and Mental Hygiene

Vol. 26(1):1-6

ELECTRONIC HEALTH RECORDS FOR THE PRIMARY CARE PROVIDER

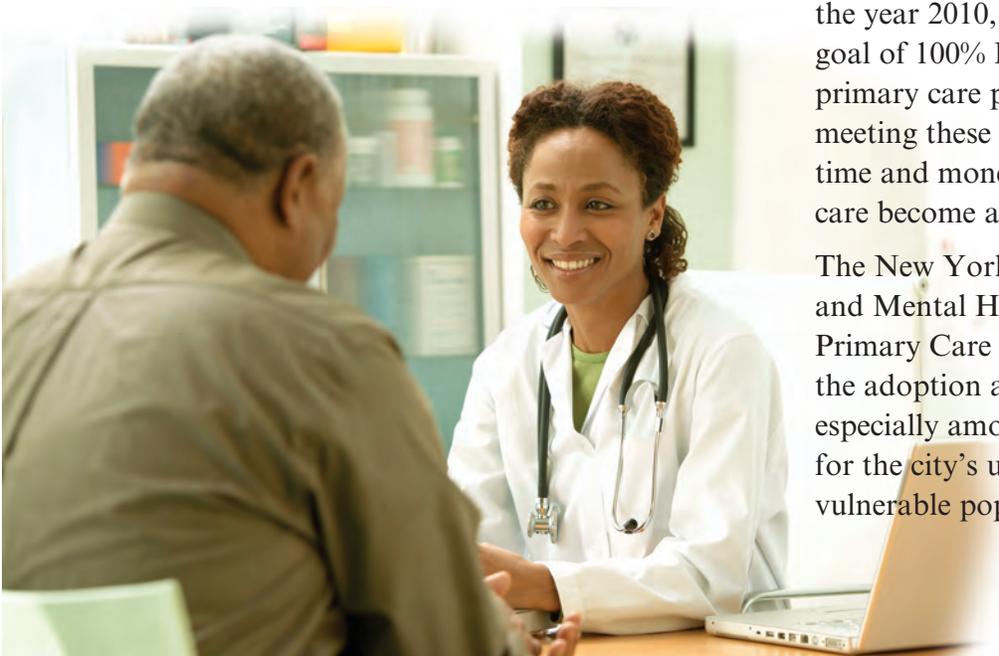
- Electronic health records can help improve the quality, safety, and efficiency of primary care practices.
- Widespread adoption of electronic health records in New York City could save thousands of lives through improved coordination of care, prevention of medical errors, and increased preventive care.
- The Primary Care Information Project, a new Health Department initiative, has put together a package of electronic health records software and services for primary care providers in New York City and will fund its deployment in underserved communities.

Access to accurate and up-to-date information is critical for medical care, but the collection and exchange of information in much of this country's medical system is slow, fragmented, and error-prone. Clinicians report that key information is missing from patient files in 14% of office visits.¹ Furthermore, about 50% of patients experience one or more medical errors transitioning from inpatient to outpatient care,² partly because more than half of primary care providers do not receive information about discharge medications and plans for their recently hospitalized patients.^{3,4}

The adoption of electronic health records (EHRs) can significantly improve the coordination of care. Recent advances in standards for electronic transfer of information now enable physician offices, laboratories, radiology practices, and hospitals to securely access and transfer patient information. Adopting these new systems and integrating them into practice workflows can improve patient safety and efficiency of care, reduce duplicate tests, enhance quality of care and health promotion, and save thousands of lives.⁴

The Institute of Medicine (IOM) has called for all physicians to utilize electronic prescribing tools by the year 2010, and federal authorities have stated a goal of 100% EHR use by the year 2014.^{4,5} However, primary care providers face significant challenges in meeting these goals, which require an investment of time and money before cost savings and improved care become apparent.

The New York City (NYC) Department of Health and Mental Hygiene (DOHMH) has established a Primary Care Information Project (PCIP) to support the adoption and use of state-of-the-art EHRs, especially among providers who care for the city's underserved and vulnerable populations.



ELECTRONIC HEALTH RECORD SYSTEMS

EHRs perform multiple functions beyond recording a patient's medical history. EHRs can automate all steps in the workflow of a primary care practice, including⁶:

- Patient check-in and appointment scheduling;
- Patient health information collection;
- Visit and procedure coding;
- Claims submission.

EHRs provide clinical tools such as: laboratory and radiology ordering and results viewing; electronic prescribing (e-prescribing); and clinical decision support systems (CDSS) which provide reminders for preventive care and help practices adhere to clinical guidelines (Table 1).⁶

Additional system tools allow practitioners to:

- Securely access patient information remotely and from multiple practice locations⁷;
- Report events of clinical or public health significance quickly;
- Transmit patient information across health systems and to care facilities in different locations.

Primary care providers may adopt various components of EHRs over time, depending on the level of practice readiness. Although it is ideal to work with a comprehensive, multi-component system in place, most practices experience some benefit at each stage of EHR implementation.⁸

Chronic Disease Management

EHRs help physicians better manage the care of their patients with chronic diseases through point-of-care reminders, benchmark reporting, population disease management, and patient education.⁹ Each of these functions is described below. Adopting an EHR system also allows providers to enhance practice workflows. Improving both workflow and care management processes is essential to improving the quality of health care.

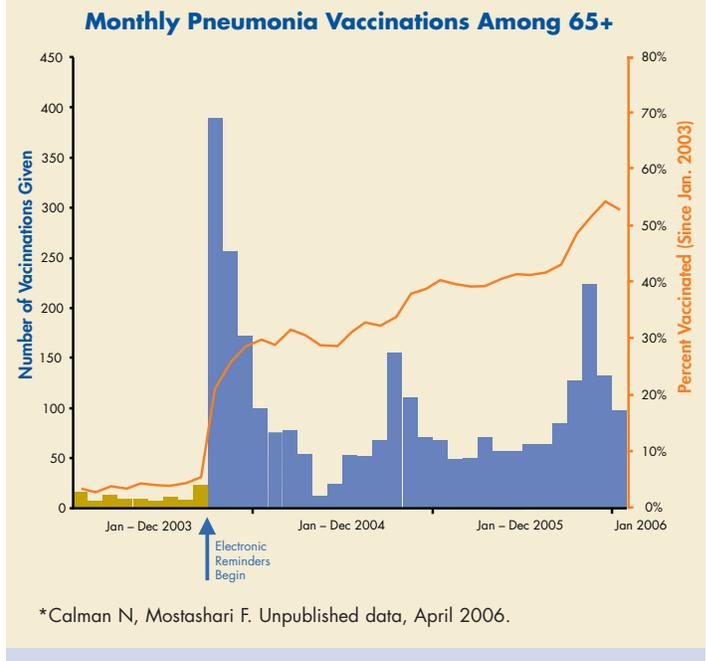
1. Point-of-Care Reminders

Point-of-care reminders help providers manage the proliferation of practice guidelines. Reminders have been shown to improve clinical processes for immunizations, blood pressure screening, Papanicolaou tests, and smoking cessation counseling, as well as glycosylated hemoglobin, lipid levels, and foot examinations among people with diabetes.^{7,10,11} Figure 1 shows the increase in pneumococcal immunization following the implementation of electronic reminders within an EHR system.

2. Benchmark Reporting

Quality measurement is critical to quality improvement, and feedback to providers improves the care they deliver. Data reporting tools within an EHR can produce quality

Figure 1. Improvement in pneumococcal immunization rates at the onset of electronic reminders in a primary care practice.*



indicator reports for comparison to national and regional benchmarks.¹² This information can also serve as the basis for performance-based incentives (see Pay For Performance, page 4).

3. Population Disease Management

In the event that it is necessary to identify patients who require outreach or targeted interventions, physicians can quickly review their entire patient population through the EHR. For example, many practices with EHRs were able to rapidly identify and contact patients prescribed Vioxx when that medication was recalled by the FDA.¹³

4. Patient Education

Patients who are knowledgeable about their condition can better participate in their own treatment. With EHRs, providers can instantly access and offer patients and their caregivers relevant and culturally sensitive educational materials. These materials can be especially helpful to patients with chronic diseases.¹²

EHR Implementation

Implementing an EHR can be challenging, particularly for smaller practices. While up-front and ongoing costs are the initial barrier for many practices (see Financial Considerations, page 4), non-monetary barriers to sustained adoption can be just as significant. These include:

- Difficulty evaluating and selecting an EHR from what may seem a bewildering array of products and options;

TABLE 1. Clinical Functions of Electronic Health Records

EHR Component	Component Description	Practice Problem	EHR Solutions
Practice Management System	Performs administrative functions, such as automated billing and scheduling appointments.	<ul style="list-style-type: none"> • Under-billing. • Inefficiency in scheduling. 	<ul style="list-style-type: none"> • Increased charge capture — providers can collect on visits that went undercharged due to incorrect CPT coding. • Allows multi-site practices to conduct centralized scheduling.
Basic Medical Charting System	Captures patient visit notes, vital signs, and demographic data electronically at the point-of-care.	<ul style="list-style-type: none"> • Missing or illegible charts. 	<ul style="list-style-type: none"> • Providers have a legible, well-organized, electronic chart immediately available at each patient visit.
Results Management	Electronically orders and maintains laboratory tests and diagnostic images.	<ul style="list-style-type: none"> • Paper copies of test results arrive with no associated chart or prior values available. 	<ul style="list-style-type: none"> • Improves efficiency by electronically linking test results with other patient information.
Computerized Physician Order Entry (CPOE) and Electronic Prescribing (e-prescribing)	Optimizes physician ordering of medications, laboratory, and diagnostic tests through dynamic lists, prompts, and alerts.	<ul style="list-style-type: none"> • Adverse drug events (including dosing and transcription errors, drug-drug, drug-allergy, drug-age, and drug-condition interactions). • Prescription writing is time-consuming and error-prone. 	<ul style="list-style-type: none"> • System alerts notify providers if the proposed prescription will trigger an allergy or adverse drug event. • One-click refills allow providers to refill multiple prescriptions simultaneously and quickly with enhanced accuracy. • CPOE systems, together with e-prescribing, may decrease adverse events by 40%.¹⁴
Clinical Decision Support System (CDSS)	Provides point-of-care reminders to improve preventive care and chronic disease management.	<ul style="list-style-type: none"> • Chronic disease care can be complex; acute complaints and requirements of daily practice can interfere with adherence to preventive guidelines. 	<ul style="list-style-type: none"> • Evidence-based guidelines are readily available and reminders are provided during patient visits.
Query and Reporting System	Allows providers to rapidly identify cases of interest, access data for reporting purposes, and create customized disease registries.	<ul style="list-style-type: none"> • A paper-based practice faces difficulty identifying subsets of patients with particular characteristics (e.g., all patients who received a prescription for a specific medication). • Claims-based performance indicators may not accurately reflect clinical quality. 	<ul style="list-style-type: none"> • Providers are able to track their performance in managing patients with specific chronic diseases or conditions (e.g., identify groups of patients with diabetes and monitor their A1c levels, blood pressure, and LDL cholesterol). • Practices can rapidly identify and contact subsets of patients who would otherwise be very difficult to identify.
Interfaces With Other Clinical Providers	Makes it possible for providers in different locations (hospitals, primary care practices, specialists' practices) to securely transmit information regarding a shared patient.	<ul style="list-style-type: none"> • Providers from different practice locations cannot access needed patient information. 	<ul style="list-style-type: none"> • With appropriate confidentiality safeguards, providers can send and receive patient information summary in the event of a hospital admission or specialist referral.
Remote Access Capability	Allows clinicians to look at patient data (charges, lab and radiology results) away from the point of care.	<ul style="list-style-type: none"> • Providers are unable to access full patient information on weekends, evenings, or holidays. 	<ul style="list-style-type: none"> • With appropriate security, access to patient information enhances information flow and reduces errors that result from a lack of up-to-date information.

- Uncertainty regarding EHR products' hidden fees and costs;
- Resistance from clinic staff (e.g., concern regarding job security);
- Time and labor necessary for data entry of existing patient records into a new EHR;
- Staff frustration due to insufficient training and/or difficulty adjusting to a new EHR system.

While challenging, these barriers are not insurmountable, and many practices have found solutions for successful EHR adoption. **Table 2** outlines steps taken by ambulatory care providers who have successfully implemented EHRs.¹⁵

Choosing a Vendor

The DOHMH recommends that you carefully research the packages and services offered by EHR vendors. The following are important points to consider when selecting an EHR vendor.^{16,17}

- **Choose a product that is certified by the Commission for Certification of Health Information Technology (CCHIT).** A list of ambulatory EHR products certified to meet functionality, security, and interoperability standards can be found at www.cchit.org.
- **Ask for real world demonstrations.** Ask the vendor to demonstrate a cross-section of complicated cases that include different ages and genders. Visit at least one facility currently using any product you are considering.
- **Identify a vendor that addresses your practice's needs.** Clarify all software licensing and ownership issues to prevent future fees associated with expansion as you and the vendor develop your system.
- **Pay only for products that deliver what they promise.** Retain a significant percentage of the total price until the receipt of deliverables or services. Contracts should define periods for complete system testing, correction of failures, and retesting the system as a whole.
- **Beware of wording in warranty standards.** Be certain that your contract clearly commits the vendor to specified levels of product support (e.g., help desk response times) and system functionality. Ask the vendor to clarify any wording that is vague or that seems deliberately ambiguous.
- **Ask questions.** Many vendors have physician advisory groups whose members should be accessible to potential customers.

Financial Considerations

Baseline expenditures for EHR hardware, software, and training can range from \$12,000 to \$24,000 per physician, and licensing fees can reach \$6,000 per physician per year. EHR adoption also involves incidental costs. Practices need to budget for a decrease in revenue during the

Patient Privacy and Confidentiality

Electronic information systems and data exchange standards can improve patient-centered care, but these systems also create new challenges for maintaining patient privacy and confidentiality. The Health Insurance Portability and Accountability Act (HIPAA) authorizes disclosure of health information for treatment purposes without consent. However, New York State law is more stringent and generally requires prior consent before disclosure for treatment purposes.¹⁸ Furthermore, records from mental health and substance abuse providers require specific consent according to state and federal regulations.¹⁹ Maintaining patient privacy and compliance with these regulations in an electronic environment places specific demands on EHRs. Important confidentiality features include:

- Electronic capture of privacy notices and signed consent forms;
- Role-based access to patient data (i.e., clerical staff can see registration and billing data, but not clinical data);
- Audit trails, which track and record each time a patient record is viewed;
- Encryption of patient data.

implementation phase, and providers must be prepared to put in longer hours initially as the EHR is incorporated into normal clinical and business processes. Primary care providers may be able to recoup some of their financial investment in EHRs through increased financial efficiency and quality incentive programs (Pay for Reporting, Pay for Performance).

Revenue Enhancement

Improved efficiency, automated billing, and formulary systems allow providers to increase charge capture. Charges that were billed incorrectly or not billed at all can now be recovered and amended. Improved documentation and coding calculators allow physicians who undercharge due to incorrect CPT (current procedural terminology) coding to collect at the appropriate higher rate.

Pay For Performance

The goal of Pay For Performance (P4P) programs is to significantly improve quality of care through public recognition and financial reward. Third-party payments

Real Financial Benefits

A cost-benefit analysis of ambulatory EHR use based on the experience at Partners HealthCare System in Boston estimated annual savings per provider of \$3,000 for chart pulls, \$2,700 in transcription costs, \$7,700 in charge capture improvements, and \$7,600 in billing error decreases. For capitated patients, there would be additional savings of 9% for laboratory costs, 14% for radiology utilization, 15% for drug utilization, and 34% for adverse drug events.²⁰

Pre-Registration Form for the NYC DOHMH Initiative

To receive further information about the DOHMH EHR initiative for underserved populations in NYC, please complete the following questionnaire.

1. Indicate which system(s) you have in place and which you would be interested in adopting:

System	Adopted	Interested in Adopting
e-Prescribing	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Clinical Decision Support Systems	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Full EHR	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

2. Identify your specialty:

- Family Practice Internal Medicine Pediatrics
 OB / GYN Other: _____

3. Define your primary practice size and type:

- Private Practice, solo
 Group Practice with _____ Physicians
 Community Health Center
 Hospital Ambulatory Care Department

4. What percentage of your primary care patient population uses Medicaid (Child Health Plus, Family Health Plus, etc.)

_____ %

5. What percentage of your primary care patient population is uninsured

_____ %

6. What percentage of your primary care patient population uses Medicare?

_____ %

PLEASE PRINT LEGIBLY.

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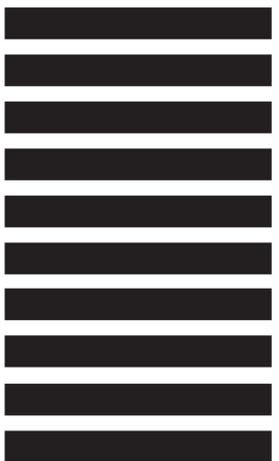
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Table 2. Lessons Learned About EHR Adoption From Selected NYC Ambulatory Care Providers

1. Establish a good working relationship with your EHR vendor (see Choosing a Vendor).

- Ask for unstructured EHR demonstrations, clarify all fees involved with adoption and future expansion, and be sure that a maintenance agreement is part of the contract.

2. Plan adequately for implementation.

- Consider a group purchase to take advantage of volume purchasing and shared support services.
- Be realistic about start-up fees, on-going costs, implementation time frames, and system limitations. Set aside sufficient personnel time and resources for planning, training, and implementation.
- Ensure support from every level of the practice, including high level administration, clinicians, and support staff.
- Identify staff “clinical champions” who enthusiastically support the shift to EHR and work with them to communicate the value of the system and to support their colleagues.
- Conduct a readiness assessment to determine hardware, software, and technical needs (see EHR Readiness Assessment checklist below).

- Think carefully about how your practice workflow will change through automation.
- Evaluate each staff member’s computer proficiency during planning and provide training based on skill level.

3. Minimize the period during which both paper and electronic systems are used concurrently.

- Plan ahead for data entry, scanning, or importing of patient data into the system. Carefully consider the resources needed and the value of the data. It is not necessary to scan all past patient data.
- Once the EHR is operational, paper charts should be “read-only.”

4. Commit to ongoing training to address underutilized aspects of the system.

- After implementation, conduct evaluations to identify ways the system can be customized to be most useful to providers.

EHR Readiness Assessment

How ready are you?

✓ Check all that apply.

1. Do you have high-speed Internet access (DSL, cable, or higher)?	
2. Do your providers have access to desktops or laptops in most exam rooms?	
3. Do most exam rooms have either wired or wireless network connections?	
4. Do you have access to local IT (information technology) support for trouble-shooting your computers and network systems?	
5. Does your practice have prior experience with the use of practice management, electronic prescribing (e-prescribing), or EHR systems?	
6. Do clinic staff have basic proficiency with the Microsoft Windows operating system?	
7. Are all key staff members willing to use computers in their daily work?	
8. Do you have a physician within your practice willing to champion the use of the EHR?	
9. Would you be willing to sustain a 1–3 month decrease in productivity during implementation and training?	
10. Do you see the use of an EHR as critical to your practice’s future?	

Each check equals one point. Your total score is:

Scoring:

- 0–4 points: Upgrades necessary before successful implementation can occur
- 5–7 points: Some work required for implementation
- 8–10 points: Ready for implementation

from the public and private sectors are provided to clinicians who meet set standards of care. EHRs can efficiently track P4P quality indicators so that providers are able to participate in P4P programs and maximize P4P revenue through quality improvements.²¹

DOHMH Primary Care Information Project

As part of a \$27 million mayoral initiative to improve the quality and efficiency of health care in NYC, the Primary Care Information Project (PCIP) has been established to support the adoption and use of prevention-oriented EHRs. The PCIP is directed especially toward providers who care for the city’s underserved and vulnerable populations.

Through an independent vendor carefully selected by the DOHMH, the PCIP has developed a package of EHR software and services for providers in NYC, and will fund its deployment in underserved communities. The PCIP initiative enables qualified providers to receive the package at a substantial discount (see Eligibility). The package includes:

- A software license for a full-featured EHR (including practice management system, e-prescribing, prevention-oriented decision support tools, and patient portal) for each primary care provider;
- 2 years of system maintenance;
- 2 years of 24-hour telephone and online support;
- Interfaces to common laboratory services;
- Data migration of patient demographic and billing information;
- Training and technical assistance during system implementation;
- Quality improvement consulting during and after implementation.

Eligibility

The EHR package is available for purchase by all NYC providers, and eligible providers can receive the package at a substantial discount through the PCIP Mayoral Initiative. To qualify for the PCIP Mayoral Initiative, practices must provide primary care (internal medicine, family practice, pediatrics, geriatrics, obstetrics/gynecology), and care for underserved populations:

- Be located within underserved NYC zip codes²²; OR
- Have greater than 30% of patients who are covered by NY State-funded insurance programs (including Medicaid, Family Health Plus, Child Health Plus, and the Healthy NY program) or are uninsured (including self-pay, sliding scale, and charity care).

Providers who participate in the PCIP must agree to fully adopt the PCIP quality initiative, which includes:

- Automated, confidential, quality reporting;
- Decision support tools for priority preventive care services;
- Linkage to public health information systems (e.g., immunization registry).

Practices must demonstrate readiness to:

- Commit protected time for clinicians and staff training, and allow for lower productivity during implementation;
- Adopt required technical infrastructure (e.g., high-speed internet connection, IT support staff).

In order to register your practice for this NYC DOHMH initiative, please either fill out and mail the attached PCIP Pre-registration Form, access the online form at www.nyc.gov/pcip, or call (866) NYC-DOH1/ (866) 692-3641. ♦

References Available Online:

www.nyc.gov/html/doh/downloads/pdf/chi/chi26-1.pdf

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Resources

New York City:

Primary Care Information Project (PCIP) (www.nyc.gov/pcip)
A NYC DOHMH initiative to facilitate adoption of EHRs among primary care providers in underserved neighborhoods.
Email: pcip@health.nyc.gov

New York State:

Medical Society of the State of New York (MSSNY) (www.mssny.org)
A non-profit organization representing the whole medical profession, MSSNY focuses on advocating health-related rights, responsibilities, and issues in the state. They have taken an active role in physician adoption of EHRs.

National Organizations:

Island Peer Review Organization (IPRO) (www.ipro.org/doqit)
IPRO is committed to using innovative methods, such as electronic health records, to assess and improve health care.

QualityNet

 (www.qualitynet.org)

QualityNet provides health care quality improvement news, resources, and data reporting tools for health care providers.

American Academy for Family Practitioners (AAFP) Center for Health Information Technology

 (www.centerforhit.org)

The AAFP center lists as its mission the promotion and adoption of EHRs and other health information technology among office-based clinicians.

Agency for Healthcare Research and Quality (AHRQ)

(<http://healthit.ahrq.gov>)

AHRQ is the lead federal agency charged with improving the quality, safety, efficiency, and effectiveness of health care in America.

Certification Commission for Healthcare Information Technology (CCHIT)

 (www.cchit.org)

CCHIT is a joint effort by the American Health Information Management Association (AHIMA), the Healthcare Information and Management Systems Society (HIMSS), and The National Alliance for Health Information Technology (Alliance). They serve as a private-sector organization that certifies EHR products.



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January 2007

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Vol. 26(1):1-6



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Suggested citation: Henning K, John P, Maxson E, Mostashari F.

Electronic Health Records for the Primary Care Provider. *City Health Information*, 2007; 26(1)1-6.

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Following a rigorous and competitive procurement process, the New York City Department of Health and Mental Hygiene (DOHMH) signed a \$20 million contract with a commercial Electronic Health Record (EHR) vendor and embarked on a collaborative development project. The Take Care New York EHR initiative includes standard data elements, registry functions for patient recall and anticipatory care; automated clinical quality measurement, decision support tools at the point of care, and patient self-management tools such as a patient portal and linkages to public health information systems (i.e., school health, disease surveillance, the Citywide Immunization Registry, and eMedNY 90 day fill history).

To eligible applicants (primary care providers with over 30% Medicaid and/or uninsured patients), DOHMH is offering a package of software and services through the Primary Care Information Project (PCIP). These providers make a commitment to pay \$4,000 per provider for a quality improvement fund and to bear the costs of hardware, network infrastructure, and productivity loss during training and go-live. For more information visit www.nyc.gov/pcip.

As DOHMH expands its Take Care New York outreach initiative in 2008, a new audience of physicians will receive the 2007 City Health Information: *Electronic Health Records for the Primary Care Provider*. The PCIP program is making the CME credit from this CHI available to a targeted physician audience for another year. Accordingly, we are providing a revised and thorough set of CME questions to challenge learners and ensure 1 hour of *AMA PRA Category 1 Credits™* for participation in this activity.



Updated Continuing Education Activity

Electronic Health Records for the Primary Care Provider (Updated February 2008)

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THE NEW YORK CITY DEPARTMENT OF
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JANUARY 2007 VOL 26(1):1-6

Learners participate in this continuing education activity through self-instruction by reading the text and taking a post-test.

Objectives

At the conclusion of this continuing education activity, participants should be able to:

1. Understand how EHRs can automate workflow in a primary care practice.
2. Describe ways that an EHR can enable chronic disease management.
3. Identify the steps needed to transition a primary care practice to an EHR.
4. Describe the ways in which eRx and CDSS systems can benefit primary care physicians.

CME Accreditation Statement

The DOHMH is accredited by the Medical Society of the State of New York to sponsor continuing medical education for physicians. The DOHMH designates this educational activity for a maximum of 1 *AMA PRA Category 1 Credit™*. Each physician should claim only those hours of credit that were spent on the educational activity.

Participants are required to submit name, address, and professional degree. This information will be maintained in the Department's CME program database. If you request, the CME Program will verify your participation and whether you passed the exam.

We will *not* share information with other organizations without your permission, except in certain emergencies when communication with health care providers is deemed by the public health agencies to be essential or when required by law. Participants who provide e-mail addresses may receive electronic announcements from the Department about future CME activities as well as other public health information.

Participants must submit the accompanying exam by January 31, 2009.

CME Activity Faculty:

Kelly Henning, MD; Farzad Mostashari, MD, MPH; Padmore John; Emily Maxson

All faculty are affiliated with the NYC DOHMH.

The faculty does not have any financial arrangements or affiliations with any commercial entities whose products, research, or services may be discussed in this issue.

Updated CME Activity Electronic Health Records for the Primary Care Provider (February 2008)

1. Which of the following is NOT a feature of electronic health records?

- A. Automated workflow tailored to the primary care practice.
- B. Security safeguards such as role-based access, audit trails, and data encryption.
- C. Immediate increase in productivity of practice staff.
- D. Indicator reports that may be used as a basis for quality improvement.
- E. Reduced medication errors with Computerized Physician Order Entry (CPOE) and Electronic Prescribing (eRx).

2. Dr. Smith, an internist for the past 30 years, is trying to comfort Mrs. C, who is experiencing an acute onset of skin rash. Mrs. C, an elderly Hispanic woman, is new to his practice. She brought with her a shopping bag full of prescription bottles, some dated as far back as January 2006. As a result of the language barrier, Dr. Smith could not obtain a pertinent medical history. Fortunately, he was able to deduce from the prescriptions that she is suffering from diabetes, hypertension, and chronic kidney failure. This scenario is commonly encountered by primary care physicians. Adopting EHRs would greatly benefit Dr. Smith's practice because:

- A. With appropriate confidentiality safeguards, he can obtain Mrs. C's medical history from other providers and health systems.
- B. EHRs will notify him of potential adverse drug events.
- C. He can provide Mrs. C with patient education material in Spanish.

- D. He will receive up-to-date practice guidelines during Mrs. C's office visits.
- E. All of the above.

3. Which of the following is not a critical step for successful EHR implementation?

- A. Select a vendor that will address your practice needs.
- B. Scan all paper records of patients in the practice.
- C. Plan for decreased patient load during implementation.
- D. Plan for increased time and labor for data entry of existing patient records.
- E. Assess staff and infrastructure readiness.

4. How well did this continuing education activity achieve its educational objectives?

- A. Very well B. Adequately C. Poorly

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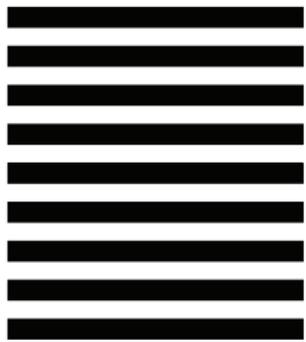
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Read this issue of *City Health Information* for the correct answers to questions. To receive continuing education credit, you must answer the first 3 questions correctly.

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