

# Electronic Health Records: Time to Take the Plunge

Paul A. Gluck, MD

**The benefits of electronic health records (EHR) are now clear, but the consequences of making the wrong decisions are significant. Armed with the right information, clinicians must begin the process of EHR implementation.**

**E**HR encompasses a wide range of systems and capabilities. Some current information systems only store patient data. Robust, fully functional systems store many data components, including medications (allergies), history, physical examination, problem lists, and health maintenance, and allow simultaneous access by diverse health care professionals.

The most robust systems have analytical capabilities and clinical decision support systems (CDSS) based on current guidelines. Also, EHR systems may be used for secondary purposes beyond direct patient care, such as quality assessment and improvement, as well as health policy planning.<sup>1</sup>

## CURRENT ADOPTION OF EHR

The National Ambulatory Medical Survey excluded information systems used only for financial management, such as billing. The most recent survey included 3,200 in-person (phone) interviews and 2,000 mail surveys (64% response rate). Based on its data, there has been a significant increase

in uptake of basic EHR systems, with a more modest increase in fully functional systems, as described in Table 1.<sup>2,3</sup>

A 2007 survey of 1,144 physicians in Massachusetts (79.4% response rate) reported an increase in use of EHR from 23% in 2005 to 35% in 2007. The individual component demonstrating the most significant increase was e-prescribing.<sup>4</sup> Even if the EHR had the capability for e-prescribing, 25% of providers used this feature only occasionally or not at all.<sup>5</sup>

Overall, the penetration of EHR, especially fully functional systems, in the outpatient environment is exceedingly slow. Factors associated with increased rates of adoption include primary care specialties, younger practitioners, availability of information technology (IT) support, large group or hospital-based practice, Western states, urban location, and teaching programs.<sup>2,6,7</sup>

## ATTRIBUTES OF AN IDEAL OBGYN EHR

There are 3 major components to the ideal EHR: (1) clinical records, (2) e-prescribing with advanced features, and (3) CDSS with frequent updates.

Aside from the overall requirements for fully functional EHR, an ObGyn practice presents special challenges for system architecture. A general ObGyn practice encompasses both primary and specialty care. Care settings include the office, ambulatory surgery center, and hospital.

Obstetric care with frequent visits presents a unique set of EHR challenges. There must be rapid data capture, ability to plot maternal trends (eg, weight and blood pressure) and fetal trends (eg, growth curves), as well as storage of nondata elements such as ultrasound images and nonstress tests.

Obstetric information and concerns can change rapidly during pregnancy, such as

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**TABLE 1. Use of EHR Systems in Office Settings<sup>3</sup>**

	<b>Basic EHR Adoption</b>	<b>Robust EHR Adoption</b>
<b>2007</b>	11.8%	3.8%
<b>2008</b>	16.7%	4.4%
<b>2009</b>	20.5%	6.3%

Basic systems include patient demographic information, patient problem lists, clinical notes, and orders for prescriptions, and can view laboratory and imaging results. Robust systems also include medical history and follow-up, orders for tests, prescription and test orders sent electronically, warnings of drug interactions or contraindications, highlighting of out-of-range test levels, electronic images returned, and reminders for guideline-based interventions.

Abbreviation: EHR, electronic health records.

adjustment of estimated due date. Ideally, prompts will remind providers of the appropriate screening test at each stage of pregnancy. Simultaneous, remote access to data in multiple locations is especially critical. Contemporaneous exchange of information (eg, for group B streptococcus status) between the hospital and the office or clinic is critical and mandates a high degree of interoperability.

Gynecology also requires storage of non-data elements such as ultrasound and colposcopy. In addition, there should be prompts for health maintenance and age-specific screening. Many of the special needs in an ObGyn practice are not currently part of the certifying process for EHR systems.<sup>8</sup>

**BENEFITS OF EHR**

More errors result from poor communication than from deficiency of clinical knowledge. A well-functioning EHR facilitates timely, complete communication and will improve patient safety and quality. In one study, management of lab findings was improved by EHR, compared to paper charts. The lab results were in the right place, signed off, and interpreted; patients were notified; and abnormal results were noted and acted on significantly more often with EHR.<sup>9</sup>

Prompts reduce the risk of drug allergies, drug interactions, and critical lab alerts, while increasing preventive care. Prompts also improve clinical decisions, communication with patients, accuracy and efficiency of prescription refills, and compliance with chronic disease guidelines.<sup>2</sup> When compared to EHR, paper admission

records to labor and delivery were more likely to miss key clinical information, such as contraction frequency, membrane status, vaginal bleeding, and fetal movement, as well as prenatal labs, eg, HIV status.<sup>10</sup>

From a meta-analysis, 23 of 25 studies showed that computerized provider order entry (CPOE) significantly reduced medication errors, as well as potential and actual adverse drug events.<sup>11</sup>

Without EHR, the labor costs to retrieve, review, and analyze medical information in support of quality improvement programs would be prohibitive.<sup>12</sup>

**Financial Benefits**

Financial benefits and return on investment from an EHR are more difficult to quantify, because of the indirect costs and savings. The initial software costs range from \$15,000 to \$45,000 per provider. Added to that, however, are the hardware costs, initial reduced efficiency, annual IT support, and transitioning records from a paper to an electronic environment. On the other hand, there is increased revenue from improved charge capture and reduced billing errors.

EHR reduced costs by decreasing waste through lower supply and printing costs, more efficient test review and patient notification, lower transcription costs, fewer chart pulls, increased productivity through easy access to records, and less employee turnover. Often these efficiencies resulted in a reduction in the number of employees.

Financial benefits of e-prescribing include fewer pharmacy recalls because of formularies, legibility, or dosing issues. Medication refills are more efficient and accurate.

In addition to the other costs, CDSS requires physician time for development and continual review of complex clinical algorithms. The financial benefits of CDSS include shorter hospital stay, reduced drug costs, improved preventative care, and prompt ordering of appropriate treatments.<sup>13</sup>

Even more difficult to assess is the reduced liability risk that results from improved safety and quality, improved coordination of care, and improved patient satisfaction. Using a logistic regression comparison in Massachusetts, a direct link was

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shown between use of EHR and fewer malpractice claims and payments.<sup>14</sup>

### BARRIERS TO EHR ADOPTION

The biggest and most consistent barrier preventing wider dissemination of EHR is concern about costs, both initial and ongoing, and uncertain return on investment. Other significant barriers include physician resistance to change, implementation problems, lack of IT support, loss of productivity during the transition, and maintenance of patient confidentiality and security.<sup>2</sup> Nothing will set back EHR adaptation more than poorly designed systems and inadequate training in which “institutions will convert complex paper-based systems to expensive digital chaos.”<sup>15</sup>

Clinician decision makers are also standing on the sidelines, concerned that the system they buy today will be obsolete tomorrow because of interoperability concerns and noncompliance with meaningful use criteria.

### MEANINGFUL USE

Under the auspices of the Center for Medicare and Medicaid Services (CMS), meaningful use criteria was proposed to improve the quality of care, increase efficiency, enhance CDSS, expand research opportunities, reduce costs, and incentivize EHR adoption. The initial proposal was modified to facilitate compliance.

To qualify for provider “bonuses” of up to \$44,000 for Medicare patients or \$63,750

## Selecting and Implementing EHR

With more than 250 EHR vendors, there is no easy way to compare products based on price or features.

### Choosing a System

#### DO

- Have a clear goal; no system is good at everything
- Create a realistic budget—costs and benefits
- Recognize that implementation of EHR is evolutionary, not revolutionary
- Involve the whole staff in selection and implementation; start with basics, then expand
- Customize patient note templates
- Redesign workflow, eg, medication refills
- Designate an EHR “champion”
- Consider hiring a consultant to evaluate systems and companies
- Go live only when ready
- Focus on Evaluation and Management codes

#### DON'T

- Document by exception
- Limit EHR choice to one marketed by a practice management system company
- Develop a “homemade” system

### Choosing a Vendor

In many respects, choosing the right company may be more important than choosing the right system. No matter how good a software package, the vendor must stand behind it with comprehensive training, responsive support, updates as needed to comply with meaningful use, and other necessary enhancements.

It is worthwhile to thoroughly investigate the vendor. How long have they been in business? How healthy is their balance sheet? How many similar systems have they installed in ObGyn practices of similar size in your locale? How long is their installation timeline? Are they certified by the Certification Commission for Health Information Technology? Will they accept penalties for issues impacting meaningful use? Get references, and check their other clients. Were they satisfied with the installation, training, and support?<sup>15</sup>

Other system considerations include the types of Internet connections available, on-site versus remote server, and clinician and staff preference for hardware interfaces.

if certain Medicaid thresholds are met, the EHR system must meet all 15 core criteria, along with 5 other criteria selected from a menu of 10 by October 2011.<sup>16</sup> The remaining 5 criteria must be implemented by October 2012.

#### CORE SET

1. CPOE
2. Drug interaction, allergy, and formulary checks
3. Up-to-date problem list
4. Active medication list
5. Active medication allergy list
6. Recorded demographics
7. Chart changes in vital signs
8. Record smoking status
9. Report ambulatory quality measures to CMS or state
10. Provide patient clinical summaries
11. Provide electronic health information on demand
12. Generate and transmit prescriptions electronically
13. Capable of electronic information exchange
14. Implement at least one CDSS tool
15. Safeguards to protect patient privacy and data security

#### MENU SET

1. Incorporate lab test into EMR
2. Generate list of patients by specific condition
3. Send reminders to patients for preventive or follow-up visits
4. Identify patient-specific educational resources
5. Provide medication reconciliation
6. Provide summary of care for transferred patients
7. Submit electronic immunization data to registries
8. Submit electronic epidemiology data to public health agencies
9. Provide timely patient access
10. Implement drug formulary checks

#### CONCLUSION

EHR will improve efficiencies, reduce medical errors, and eventually result in a positive return on investment. The question is not *if* clinicians should convert to a robust EHR system but *when* and *how*.

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