Electronic Health Records: Design, Implementation, and Policy for Higher-Value Primary Care

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Electronic health records (EHRs), and the policies and workflows around them, are inconsistently aligned with the needs of primary care patients and physicians. This results in substantial waste of physician and support resources, high rates of burnout (1, 2), and a decrease in primary care capacity precisely at the time when our nation needs a stronger primary care foundation (3).

We propose a set of principles (**Table**) directed toward vendors, institutional leaders, policymakers, and physicians to support higher-value primary care. These principles draw on our expertise in patient care, quality assurance, industrial and systems engineering, and policy and EHR implementation. They are inspired by discussions with clinicians after more than 100 presentations on redesigning primary care practice and our shadowing of physicians at nearly 50 sites. We hope they will contribute to a multistakeholder dialogue and serve as a call to action.

Principles

Patient-Centered Design

Add Value for the Patient. Technology, regulation, and implementation policies should add net value to the patient's care and experience. Current EHR design and use is often visit-based and payment-centered and directs more work to the physician. Therefore, EHRs can paradoxically diminish value for the patient.

The Primary Function of EHRs Is Clinical Care. Electronic health records should be designed and used as sense-making and communication tools (4). To be good stewards of information, health care professionals must concisely organize key elements, use structured or copied and pasted text judiciously, and pay close attention to the longitudinal portions of the record (for example, problem and medication lists and the care plan). The optimal person to input information will vary across settings and may not always, or even often, be the physician. Administrative and research activities, although valuable, must be subordinate to the clinical function. Information organized primarily for billing justification or other organizational purposes, including performance measurement and audit trails, can unintentionally undermine its fundamental clinical purpose.

Health Care Professionals

Well-Being. Patients' experiences will not be optimized without consideration of the professional well-being of those who serve them. When nurses, physicians, and other health care workers are overwhelmed or distracted by EHR-associated tasks, patient care can suffer (2, 5).

Match the Work to the Worker. All staff should work "to the top of their license," especially those with the greatest investment in training. It is not always safer to require that the physician perform a task. Those responsible for complex cognitive work should not also be responsible for routine tasks, such as order entry, billing, and documentation, because they may interfere with higher-level tasks, including synthesizing and interpreting information, balancing risks and benefits, guiding patients in shared decision making, and communicating with others (3, 6).

EHRs Are Shared Information Platforms for Individual and Population Health. The entire care team shares responsibility for using the EHR to support coordinated care for individual patients and for population management.

Efficiency

Minimize Waste. Wise use of health care resources requires minimizing waste. Time matters because it translates into quality, access, and safety. Time per task and time to comply with regulations should be tracked and reduced. Human factors expertise can inform EHR design to minimize mouse clicks and scrolls and screen changes, as well as create better information displays to decrease cognitive workload. A policy environment that reduces documentation requirements and supports team-based care facilitates efficiency. Not every element of care can be captured in the EHR. Not every element of care should require physician signoff. Many signatures in health care do not add value and are a form of waste.

Alignment With Clinical Work. Electronic workflows should align with clinical workflows rather than being rigid sequences that physicians must progress through with patients. Medical care is often chaotic (7) and nonlinear, and EHRs must support this complex patient-centered interaction.

Various Methods of Communication. The goal is effective and efficient communication rather than to "go paperless." The team should be encouraged to use the best method for the situation, including verbal one-on-one interaction in which dialogue is helpful. Asynchronous electronic communication has a role but must be used judiciously to avoid overwhelming the e-mail inbox with messaging that either was unnecessary or could have been handled more effectively by direct conversation (8).

Regulation and Payment

Sufficient Resources. Higher-value primary care cannot be delivered on a shoestring budget. Many activities in which teams could be engaged (for example, using the EHR to identify and manage high-risk patients) represent new work that requires new resources. The high volume of electronic information in comprehensive primary care cannot be handled with the staffing ratios of the past. In ad-

Table. **Principles of EHR Design, Implementation, and Policy**

Patient-centered design
1. The use of an EHR should add value for the patient.
2. The primary function of an EHR is clinical care.
Health care professionals
3. The use of an EHR should improve, or at a minimum not reduce, the well-being of health care workers.
4. The use of an EHR should align the work with the training of the worker.
5. The EHR is a shared information platform for individual and population health.
Efficiency
6. The use of an EHR should minimize waste.
7. Electronic workflows should align with clinical work.
8. Various methods of communication, including nonelectronic forms, will be necessary for optimal patient care.
Regulation and payment
9. Sufficient resources should be available for the new work associated with the advanced use of an EHR.
10. Policies around EHR use should reflect the strength of the evidence base supporting them.
11. Regulatory balance between often competing values (i.e., clinical quality vs. security or efficiency vs. performance measurement) should be sought.

EHR = electronic health record.

dition, dictated and transcribed notes may communicate the patient narrative and medical decision making more clearly and efficiently than notes primarily comprising structured and physician-entered text.

Evidenced-Based Policy. Policies should be explicit about the evidence base supporting them and the time required for compliance, with special attention given to the generalizability of available evidence. In the absence of evidence, a good default strategy is activating professionalism (9) rather than expecting and permitting regulators to fill an evidence gap with additional rules.

Regulatory Balance. Regulation is not the only driver of quality and can be counterproductive if applied too heavily. Unopposed emphasis on security, privacy, and performance measurement may come at a cost to quality; efficiency; and the satisfaction of patients, staff, and physicians. The effects on patients and those who care for them need to be considered.

Conclusion

After a decade of growth in the use of EHRs that has been both promising and painful, we believe it is time to step back and develop principles for their design, implementation, and regulation that support higher-value primary care. Physicians are voting with their feet and abandoning primary care at a time when their expertise is acutely needed. If primary care is to survive as a specialty in which patients receive comprehensive, cost-effective, safe, and personalized care, we need a new generation of electronic information tools and new policies for the sociotechnical environment in which they are implemented (10).

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