

# Making It Easy to Do It Right

At the turn of the last century, William Osler, Harvey Cushing, and other clinical leaders restructured hospital organization, established scientific research as the foundation for clinical practice, formalized clinical education, and set and enforced high ethical and personal standards of performance among physicians and nurses. Their era marked a turning point in **health** care delivery. Prior to 1900, seeking a physician's help for a serious illness did little to change the course of the disease,<sup>1</sup> but since that time life expectancy in the United States has almost doubled. A child born in the United States in 1998 can expect to live almost 80 years, as compared with 49 years a century ago.<sup>2</sup> Early advances in life expectancy derived mostly from improvements in public **health**, such as better sanitation and immunization programs. In the past 30 years, effective treatments for disease have continued to extend life expectancy. Since 1970, age-adjusted mortality rates for heart disease and stroke, the first and third most common causes of death in the United States, have fallen by more than 50 percent and 40 percent, respectively.<sup>2,3</sup>

Despite these impressive accomplishments, clinical performance in the United States still falls far short of its theoretical potential. The National Roundtable on Quality of the Institute of Medicine catalogued a broad array of failures in the application of existing knowledge to routine care.<sup>4</sup> Underuse of proven interventions is one major subcategory of such failures.<sup>5</sup> For example, across all care delivery settings, only 52 percent of eligible adults older than 65 years of age receive the recommended yearly influenza vaccine, and only 28 percent receive the indicated pneumococcal vaccination. Overall, just 50 percent of Americans receive appropriate preventive care.<sup>6</sup> More recently, the Committee on Quality of **Health** Care in America of the Institute of Medicine called for a massive redesign of the **health** care delivery system to address systemwide failures of execution, extending well beyond preventive care.<sup>7</sup> Among the recommendations of the committee was the development of a clinical-information infrastructure that would eliminate most handwritten clinical data by 2010.

In this issue of the *Journal*, Dexter et al. describe the results of a randomized, controlled trial assessing the ability of the clinical-information system to increase the use of four proven preventive strategies among hospitalized patients with indications for the interventions.<sup>8</sup> For physicians in the intervention group, the computer system used on-line patient data to generate reminders for preventive care for appropriate patients. At base line, 1 percent or fewer of eligible inpatients received the pneumococcal or influenza vaccine. Furthermore, only 18.9 percent of patients at risk for venous thromboembolism received subcutaneous heparin, and only 27.6 percent of patients hospitalized for acute myocardial infarction were discharged with instructions to take aspirin. Physicians who received reminders as part of their routine use of the order-entry system dramatically increased their use of all four preventive strategies.

Studies of clinical errors have identified a series of human limitations that lead to predictable failures of the **health** care delivery system.<sup>9</sup> Reliance on "prospective recall" — that is, depending on hospital staff to remember to initiate necessary actions at

appropriate times, within a complex environment — ranks high on that list.<sup>10</sup> Reminders are one proven way to improve human performance. Dexter et al. enhanced the value of their intervention by using techniques expected to increase compliance, such as presenting reminders in the form of prepared computer orders for the interventions, and incorporating them into routine patient care.<sup>11</sup> Steps were taken to minimize extra work; usually, a single keystroke sufficed to accept or reject each order.

The report by Dexter et al. illustrates a new generation of support tools for clinical decision making that "make it easy to do it right." Beyond reminders, these systems can integrate clinical data to help professionals manage an increasingly complex practice environment. For example, such systems have improved the prescription of antibiotics within hospitals<sup>12</sup> and have guided optimal ventilator settings for patients with acute respiratory distress syndrome.<sup>13</sup> When important research findings prove that a treatment is generally effective, it seems far more sensible to make that treatment a default action of the **health** care system, with physicians providing close oversight and having the ability to override or modify the treatment, than to load it onto already overburdened humans as yet another task to remember.

Why, then, are computerized information tools not more widely available in clinical practice? The study by Dexter et al. points to two potent factors that leave the field of clinical informatics, at best, still in its late adolescence. First, support tools for decision making must draw together a broad array of clinical information, from many different information subsystems. Dexter et al. incorporated patients' demographic characteristics, problem lists, prior discharge diagnoses, vital signs, active inpatient orders, prior pharmacy **records**, radiologic results, and the patients' own reports of what vaccines they had received. Other obvious sources of data include the clinical, microbiology, and surgical-pathology laboratories. Such data are not always available through automated systems. Even when they are, a lack of standards for format and content among software vendors makes it difficult and expensive to combine disparate information about a patient into the complete, centralized **electronic record** necessary for efficient clinical use. Although some have hailed the Internet as the foundation for a new era of **electronic clinical records**, Internet vendors have had little success in bringing together the myriad sources of local clinical data on which sound practice relies.

Second, Dexter et al. note that an earlier intervention, which required physicians to choose to review suggested preventive measures using just a few keystrokes, led to no change in practice.<sup>14</sup> To be widely accepted by practicing clinicians, computerized support systems for decision making must be integrated into the clinical work flow. They must present the right information, in the right format, at the right time, without requiring special effort. In other words, they cannot reduce clinical productivity. They cannot require physicians to learn to use a series of disconnected computer systems and must not be at odds with physicians' concept of the medical **record** or sense of autonomy in decision making. Despite improvements, integrated computer interfaces that elegantly support clinicians in daily practice are still a work in progress.

The goal of nationwide use of **electronic** medical **records** by 2010 may be reached most readily through a series of incremental steps, each of which preserves or may even enhance clinical productivity. Some steps, such as **electronic** billing and scheduling systems and **electronic** pharmacy **records**, are already widely used today and provide data on patients' demographic characteristics and medication use. Progress toward full **electronic** laboratory and radiology reports is well under way. Dictation and transcription, computerized voice recognition, or the use of boilerplate text that is easily modified to reflect a particular physician's findings all provide simple means to capture notes **electronically** as free-form text.

Bringing these diverse sources of data together in an "**electronic** filing cabinet" can eliminate the disadvantages of paper **records** and can provide immediate, complete access to patient **records** from many locations (including, with appropriate security safeguards, access from home for on-call physicians). When combined with encoded lists of problems, medications, and allergies, these simple systems can improve clinical care, without demanding the massive investment and change required for a fully encoded medical **record**. With further development, they can provide the foundation for incorporating important research findings into routine clinical practice.

If such systems fulfill their promise to address failures of clinical performance, reduce injuries to patients, and improve the outcomes of care, they may define the next century of clinical practice much as our professional forefathers defined the century that has just ended.

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