Chapter XII

Using Web-Enabled Technology to Promote the Adoption of Practice Guidelines

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The rapid expansion of scientific knowledge brings increased physician uncertainty in clinical decisionmaking. Clinical practice guidelines have been developed to reduce physician uncertainty. The broad movement to develop and disseminate clinical practice guidelines is rooted in evidence-based medicine. Although the development and dissemination of evidence-based guidelines has increased dramatically over the past decade, studies indicate serious deficiencies in the adoption of guidelines into practice. Developments such as client/server networks, the Internet, and the World Wide Web are rapidly expanding potential educational applications for information and communications technologies and the capacity for introducing strategies to promote guideline adoption. Web-enabled computer technology can enhance the capability of healthcare information systems to reduce variation in clinical decisionmaking.

Healthcare information systems contain various types of information and data that contribute to clinical decisions made by physicians and other healthcare providers. Some data are patient specific; other types of information and data provide general parameters or frameworks for decisionmaking. Sophisticated links within some systems provide specific guidance at the time a decision is being made, such as the contraindication of a drug by a recent laboratory test for a hospitalized patient. Healthcare organizations, whatever the status of their information systems, wish to reduce variation such as the variation in clinical decisionmaking. Many approaches have been tried to reduce variation including the development of clinical practice guidelines, audit and feedback of information, educational

courses, opinion leaders, academic detailing, and computerized reminder systems, but variation remains widespread (Anderson, 1994; Davis, Thomson, Oxman and Haynes, 1992, 1995; Davis and Taylor-Vaisey, 1997; Oxman, Thomson, Davis and Haynes, 1995).

The Internet is an increasingly popular medical information resource for consumers (Classen, 1998). In a 1997 survey 43% of about 40.6 million U.S. adults 18 or older who had accessed the Web did so to obtain health information (Classen, 1998). At least 10,000 health and medical sites are on the World Wide Web (Ferguson, 1998). Physicians cannot only use the Web for patient management tasks, personal and professional learning but are able to offer their patients high quality resources online that can be personalized for them (Ferguson, 1998). Relatively recent developments such as client/server networks, the Internet, and the World Wide Web are rapidly expanding potential educational applications for information and communications technologies and the capacity for introducing secondary strategies to promote guideline adoption (Chodorow, 1996; Masys, 1998; Sebaldt, 1997; Yolton, 1992). Evolving computer and instructional technologies are increasing the use of hypermedia, virtual reality, teleconferencing, and distance education (Dunnington and DaRosa, 1994). Use of hypermedia publications through the Internet is now common. Hypermedia is based on HTML format and can be easily developed and distributed by a Web server (Schulz, Schrader and Klar, 1997). The Internet provides access to a wide range of literature, educational materials, resources, and communication opportunities. The Internet can be used for self-guided education and collaboration. Internet-based continuing medical education modules incorporate multimedia and can be utilized at the physician’s convenience (Davis, Wythe, Rozum and Gore, 1997; Jaffe and Lynch, 1995; Jewett, Holsinger, Kuppersmith and Buenting, 1998; Qayumi, 1997; Henry, 1990; Klar and Bayer, 1990).

The purpose of this chapter is to present a Web-enabled technology which will enhance the capability of healthcare information systems to reduce variation in clinical decision-making. The objectives of this chapter are to: 1) describe an electronic strategy designed to promote clinical practice guideline adoption; 2) provide a template for those who wish to develop a Web-enabled strategy to promote clinical practice guideline adoption; and 3) present preliminary data on the effectiveness of a Web-enabled strategy in influencing clinical decisionmaking.

**DISSEMINATION OF PRACTICE GUIDELINES**

The rapid expansion of scientific knowledge leads to increased physician uncertainty in clinical decisionmaking (Gerrity, Earp, DeVellis & Light, 1992; Kassirer, 1989; Peterson & Pitz, 1988). Ambiguity can be introduced into clinical decisionmaking by the presence of conflicting evidence or by a lack of evidence about the probability of outcomes (Curley, Young & Yates, 1989). In a large study of physician uncertainty, most physicians worried they could not keep up with the medical literature, and most felt they had not been fully aware of the degree of uncertainty medicine entailed when they chose it as a career (Marks, 1997). One study found that the stress physicians experience in dealing with uncertainty has a negative effect on their clinical performance (Anderson, Jay, Weng & Anderson, 1995).

In an attempt to reduce clinical uncertainty and resultant practice variation, numerous clinical practice guidelines have been developed over the past 15 years and distributed in various formats by the Agency for Health Care Policy and Research, medical specialty societies, health maintenance organizations, and third-party payers (Institute of Medicine,
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