

Comprehensive Electronic Decision Support Systems

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This Open Forum describes a vision of comprehensive electronic decision support systems that could provide information and supports to both clients and clinicians in order to facilitate shared decision making and encourage collaborative management of illness and wellness. The authors argue that these systems have the potential to improve mental health care by enhancing and connecting the three elements of evidence-based medicine: client preferences, research evidence, and clinician skills. (*Psychiatric Services* 61:714–717, 2010)

The major clinical themes in U.S. public mental health today are evidence-based practices and recovery (1,2). Evidence-based practices are demonstrably effective interventions that help people reach important outcomes. Recovery de-

notes an ideological commitment to helping people with the most severe mental disorders overcome their illnesses and pursue functional goals, meaningful activities, mutual relationships, and active citizenship in their communities. This Open Forum describes how the application of information technology in the form of comprehensive electronic decision support systems could transform evidence-based practices and recovery ideology from phantasms to reality.

The current mental health system falls far short of adopting evidence-based practices and helping people to recover from the most severe mental illnesses. According to epidemiologic data from the National Comorbidity Study in the early 1990s, 60% of persons with serious mental illnesses received no mental health treatments in the previous year, 25% received clearly inadequate treatments, and only 15% received minimally adequate treatments (3). Since that time, community mental health services in the United States have deteriorated considerably (4,5).

Both the Institute of Medicine (1) and the New Freedom Commission (2) recommended using modern information technology to improve the quality of mental health care in the United States. Currently, the United States lags behind other high-resource countries in the use of health information technology, and mental health lags behind other areas of medicine in adopting information technology (6).

Comprehensive electronic decision support systems

Structured supports that help clients, clinicians, or both to make better decisions regarding health care are called decision aids. Client decision aids generally include unbiased information on illnesses and treatments, help with values clarification, and guidance or coaching for deliberation and communication with providers. Research in many areas of medicine shows that decision aids improve individuals' information base and the quality of their decision making—that is, decisions are more in line with the evidence and with personal values (7). The impacts on more distal health outcomes have not been consistently demonstrated. Decision supports for clinicians typically encompass diagnostic systems, reminder systems, disease management systems, or medication-prescribing systems. Research shows that clinician decision supports generally improve practitioners' performance—for example, by reducing medication errors and increasing adherence to evidence-based guidelines (8,9). Again, the impacts on client health outcomes have not been consistently demonstrated.

Computerized decision aids have obvious advantages over paper-and-pencil forms—for example, linkage with other electronic medical records, incorporation of algorithms for evidence-based care, and aggregation of data on services and outcomes at the client, clinician, clinic, or system level. Electronic systems

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typically support clients or practitioners, but they do not link them in a process of shared decision making. Recent mental health research suggests, however, that linking clients and practitioners may have advantages (10). Comprehensive systems could be used to collect and summarize longitudinal data on client status, concerns, responses, side effects, preferences, and personal treatment goals; practitioner assessments and ratings of responses; laboratory and imaging tests; and historical information on treatments and responses. These systems could also provide information on evidence-based practices to clients and clinicians simultaneously and, perhaps in the near future, adjust the information according to individual risk factors. Comprehensive systems, in contrast to separate systems, could link the two partners in a collaborative process in which they consider information on reasonable treatment alternatives together, share their perspectives, mutually agree on decisions, and develop action plans with shared responsibilities (11).

Separate records, systems, or databases are developing more rapidly than linked systems but may fail to integrate information and key participants in the decision-making process. Whereas conventional, separate clinical information systems can present a barrier to consumer-provider partnerships, comprehensive systems aim to amplify the client's voice and enhance partnerships. Highlighting clients' concerns and preferences regarding treatment options places them at the center of decision making and facilitates communication between clinicians and clients. In this model, information is bidirectional, accessible, and transparent to both parties. By contrast, asking clients to rate items on symptom rating scales through a client portal for the clinician to review falls short of displaying information in user-friendly formats that are fully transparent and accessible to both parties. The crux of shared decision making is two informed participants discussing and reaching consensus on treatment plans (12). In long-term illnesses, including most mental dis-

orders, patients' decisions are complex, reconsidered repeatedly, and carried out apart from health care providers (13). Partnership is therefore essential to better help these patients with the decision-making process.

Current research

Research on shared decision making is rapidly emerging in mental health. At least eight recent randomized controlled trials demonstrate that shared decision making in mental health settings can improve client satisfaction, quality of life, and treatment adherence and reduce unmet needs, substance abuse or dependence, and depression (14). Electronic decision support systems are also beginning to be used more widely in mental health.

The Veterans Health Administration has adopted a clinically oriented electronic medical record that facilitates evidence-based care, monitoring of care, and review of outcomes; the system has also recently added a client portal (www.myhealth.va.gov). In several European Union countries, a computerized system that enables clients with schizophrenia and their clinicians to compare their perspectives on goals and negotiate plans has demonstrated improvements in satisfaction and quality of life and reduced unmet needs (10). The New York State Office of Mental Health is currently implementing an electronic system that offers clients direct access to their medication history, their current medication regimen, and current medication guidelines (Finnerty M, personal communication, 2009). Many proprietary systems are currently adding client portals as well. However, as noted above, these electronic medical records with client portals do not constitute comprehensive, collaborative systems.

Research on comprehensive electronic decision support systems features five steps. The first step involves development. Several surveys and qualitative studies have shown that most mental health clients prefer shared decision making and are capable of using computers to express their preferences and goals in a

more structured and explicit way (11,15,16). Mental health clients in paid consultant positions can therefore help to conceive, design, and test comprehensive systems.

The second step involves testing the feasibility of the system. Deegan and colleagues (11) have demonstrated that paid peer staff can operate a decision support center in psychiatric medication clinics. There, consumers access an Internet-based software program to create a one-page report for use during the medication visit. The report is used to support recovery and shared decision making about next steps in medication treatment. The approach seems to have promise for robust utilization in routine mental health settings and is currently being used in seven mental health centers and one state hospital in Kansas, Pennsylvania, and Massachusetts.

The third step involves testing different decision-making contexts. A recently developed software architecture, the Dartmouth Decision Support Designer, is being used across diverse clinical contexts (17). Current prototypes in different stages of development focus on smoking cessation, goal setting, supported employment, and interventions for co-occurring substance use disorders.

The fourth step involves usability testing. Clients, clinicians, researchers, and computer specialists are collaborating to develop and test items, formats, modes of representation, and methods of individualization. This process, called usability analysis (18) or implementation science, involves trying different ideas with diverse user groups, obtaining detailed feedback, and revising presentations, sometimes with small experiments and formal data collection.

The fifth step involves investigating outcomes. When examining outcomes, there are two important questions: Can information systems that link providers and patients in shared decision making enhance process quality? And can these systems turn process quality improvements into outcome improvements? As noted above, few studies have

thus far demonstrated distal health outcomes in addition to proximal process outcomes.

Discussion

Comprehensive electronic decision support systems promise benefits that are in agreement with the goals of evidence-based practices, recovery ideology, and shared decision making. These advantages are currently theoretical and need to be examined by research.

For clients and families, comprehensive systems have the potential to promote client centeredness and self-determination. Specifically, they could organize scientific information on treatment effectiveness in accessible formats, inspire hope through videotaped first-person accounts of recovery, empower and activate clients to participate, and provide tools to facilitate communication, conflict resolution, shared monitoring of progress, and shared decision making.

For clinicians, comprehensive supports could relieve the burden of data collection because clients could enter status data directly, thereby creating more time for meaningful discussions regarding concerns and decisions. The systems could also be used to enhance clinicians' education regarding evidence-based practices, to increase their attention to clients' concerns about treatment, and to encourage shared decision making by presenting longitudinal outcomes, client preferences, and guidelines to both parties for discussion.

For administrators, current electronic systems typically facilitate monitoring of services and billing, but they inadequately attend to quality and outcomes. Administrators do not get the data they need for quality management (19). Outside monitoring through fidelity reviews addresses some of these issues but is limited and expensive. Direct client and clinician data entry into comprehensive electronic decision support systems could offer a more efficient solution.

State, county, and other mental health authorities typically have only anecdotal data on client preferences, minimal data on quality and outcomes, and no data on long-term

cost-effectiveness (19). With decision support tools that aggregate data across agencies, mental health authorities could access real-time information needed for political accountability and policy decisions.

The use of information technology also involves risks. One danger is that these systems will simply hardcode outdated practice principles, unbalanced access to information, and paternalistic decision making into an electronic format that in turn will further institutionalize these approaches. For example, electronic decision support systems that focus on symptom reduction but exclude client goals and strengths-based perspectives will simply reinforce bad practice. Most clients are not exclusively concerned with symptom reduction; they are instead trying to get their lives back on track through functional activities and relationships that make life worth living. Electronic decision support systems must reflect these more holistic, strengths-based, recovery-oriented concerns. Another danger is that electronic decision support systems will not be culturally sensitive and inclusive. Toward this end, ethnographically diverse participants and settings must be involved in designs and testing. In addition, many researchers are working on the security issues involved with the systems.

Health information technologies in general, and more sophisticated electronic decision support systems in specific, have gained slow ground in medicine. Problems related to clinician buy-in, start-up costs, initial time investments, and computer literacy have thus far constrained the ability of these technologies to improve health care. The public mental health system presents several additional challenges. State systems are often preoccupied with political and financial exigencies rather than with long-term outcomes and investments in infrastructure. As a result, the substantially underfunded and underdeveloped computing infrastructure available in many areas may constrain the ability to implement comprehensive electronic decision support systems. Another difficulty is the perception that computers will interfere

with the essential human interactions between care providers and clients. Finally, the perception that persons with serious mental illnesses are not competent to participate in decision making because of cognitive deficits and fluctuating symptoms pervades the field and society. The burden is on researchers to demonstrate usability, quality, and outcomes.

Conclusions

Comprehensive electronic decision support systems offer a powerful tool to overcome many of the problems that currently impede the adoption of recovery ideology and evidence-based practices. The specific solutions are not yet clear and will require considerable research in real-world settings to ensure that these systems are compatible with full client participation, current research, and expanding clinical skills.

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Submit Management Problems to an Interactive Column

Readers of *Psychiatric Services* are invited to submit management problems encountered at their work site to the journal's new interactive column, Case Studies in Public-Sector Leadership.

The editors of the column, Jules M. Ranz, M.D., and Susan M. Deakins, M.D., director and associate director, respectively, of the Columbia University Public Psychiatry Fellowship (PPF) will use an electronic mailing list (e-list) to present the problem to PPF fellows and alumni. The fellowship, which prepares psychiatrists for leadership roles in the public sector, emphasizes the importance of understanding systems and working in teams to solve problems, and the PPF e-list has proved useful as a tool to generate a collaborative problem-solving process. The first column, published in the October 2009 issue, addressed obstacles encountered at a community outpatient clinic during implementation of an initiative to monitor the metabolic effects of second-generation antipsychotics.

Please send a description of the problem, along with contact information, to Dr. Ranz at jmr1@columbia.edu.