Developing an Integrated Information System for Specialized Addiction Treatment Agencies

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Abstract

This article outlines the development of an integrated information system for specialized alcohol and drug treatment agencies in Ontario, Canada. The system is being developed following a strategic planning process involving provincial funding ministries and coalitions of service providers. An overview of the system's development is provided and the implementation of one subcomponent, a client-tracking system, is described. Some challenges to the implementation of this component are identified.

An increasing body of research shows that people receiving treatment for alcohol and/or drug problems are more likely to reduce their use of these substances and show improvements in other life areas than those not treated.[1-3] Research also shows that the benefits of treatment to society can outweigh the costs from a financial perspective.[4,5] However, there are many uncertainties surrounding addiction treatment and many challenges to the development of accessible and cost-effective treatment delivery systems. These challenges include the development of effective case-finding, referral, and recruitment mechanisms;[6,7] the establishment of a range of services consistent with the varying needs of different client groups;[8-10] the development of the means to ensure an appropriate "match" between client needs and services rendered; and mechanisms to coordinate the delivery of service within and between addiction treatment and other health and social service agencies.[11,12] These challenges are especially acute in Ontario, where there are more than 200 community-based, quasi-autonomous, addiction-specific agencies funded by several different sources[13] and no single organization with the authority, or the resources, to coordinate the development of the overall treatment system.

Challenges to the development of an optimal treatment system for Ontario are being addressed in several ways, especially through the development of an overall substance abuse strategy and associated attempts to coordinate and otherwise improve prevention and treatment initiatives in the province.[14] A reform initiative implemented in 1996, and still underway at the time of writing, also aims to ensure that the overall treatment system is optimally effective and efficient. This reform initiative is referred to as the Rationalization Project.

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As part of the substance abuse strategy, a steering committee involving provincial funding ministries, services providers, planners, and researchers was established to address treatment system issues, and several relevant projects have been initiated. Through our efforts and other staff of the Addiction Research Foundation, members of this committee were persuaded of the need for an improved information system to support planning and evaluation. The committee was made aware that, unlike other Canadian provinces and many American states,[15] Ontario had no centralized information system for alcohol and drug treatment programs. While many agencies collected data to satisfy local information needs, there was a lack of uniformity in the definitions used and types of data collected. Members of the steering committee thus became concerned that the absence of uniform data had led to an inequitable distribution of treatment resources across the province and ongoing support for services of unknown cost-effectiveness. Committee members were also conscious of the need for increased accountability within the addiction treatment sector, given diminishing government resources for all types of human services. The steering committee therefore set a high priority for the development of a uniform data collection system for specialized addiction treatment services. This article outlines the system's main features and ongoing development and describes the implementation of one component—a client-tracking system.

An Overview of Ontario's Addiction Treatment System

At the start of the system-planning phase, Ontario had 228 organizations that received funds to provide alcohol and/or drug treatment services. In 1992, the last date for which data are available, it was estimated that there were 75,000 cases in treatment* and that the total costs of the treatment system were $116 million (U.S.$81 million). Services were sponsored by general and psychiatric hospitals, mental health clinics, public health units, nonprofit community-based agencies, native Indian bands, and private organizations. It is anticipated that the number of distinct administrative agencies will be significantly reduced through mergers resulting from the current Rationalization Project.

Most agencies that specialize in addiction services receive some funds from the Ontario Ministry of Health through the Substance Abuse Bureau.[13] However, other departments of the Health Ministry (e.g., the Institutions Branch) and the Ministry of Corrections also fund some agencies as do the Salvation Army, the United Way, and some municipalities. The Canadian Federal Government also funds some agencies through the National Native Alcohol and Drug Abuse Program. At the start of the planning process, some addiction treatment services (principally recovery homes) were funded by the Ministry of Community and Social Services. However, these were later transferred to the Substance Abuse Bureau.

The substance abuse strategy designates the Health Ministry as the "lead" ministry for provincially funded services. The interministerial steering committee, under the auspices of the Substance Abuse Bureau of the Ministry of Health, advises the ministry in this lead role. This committee has the potential to significantly influence the future of Ontario's addiction treatment system in that it involves representatives from key provincial ministries, planning bodies, and voluntary coalitions of service providers.

Developing the System

It was agreed by all stakeholders that there was a need for an information system that would be sensitive to the complexities of Ontario's treatment delivery system, place minimal demands on service providers, and have the capacity for future expansion.

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*This estimate is derived from a provincial survey of service providers. Individuals would be counted more than once if they used multiple services within the year.

In 1992, a working group involving services providers was established and supported by the Addiction Research Foundation, a provincial agency with the mandate to conduct research and provide advice on policy in the substance abuse field. Over the next 2 years, the committee undertook an extensive analysis of large-scale information systems in other jurisdictions and conducted a survey of Ontario's treatment services to assess their computer hardware and software resources and capabilities. Consultations with technology experts, coalitions of services providers, provincial ministry representatives, and managers of regional data collection systems in the province also took place. Finally, a survey of agency managers was conducted to obtain their suggestions for the types of information to be collected.

The outcome was a broad consensus about the information system's goals, boundaries, key data elements, and other features. It was also recognized that the success of the proposed system would depend heavily on the support and full participation of treatment agencies and the Ontario Substance Abuse Bureau. Services providers and the bureau were therefore involved in both the planning and implementation of the system.

The following specific objectives were developed: (1) to establish a provincial database that would monitor information on client characteristics and service use, (2) to establish a database to capture information on the total cost of treatment services and benchmark service unit costs and average cost per client within different regions and for the province as a whole, and (3) to establish a mechanism for the periodic follow-up of representative samples of clients to show relationships between service use and costs, client characteristics, and treatment outcomes. Once realized, these objectives will complement those of the province's Drug and Alcohol Registry of Treatment (DART), an agency that routinely monitors the availability of treatment in the province.[16] Together, DART and the client information system will meet the requirements of a broad provincial accountability framework with four main components. These are summarized in Table 1.

It is expected that all specialized alcohol and drug treatment agencies in the province will eventually be engaged in the information system. However, the system has only been formally endorsed by the Substance Abuse Bureau of the Ministry of Health. This bureau provides funding to the majority of agencies that provide addiction services and has made participation in the information system a requirement of funding. The Ministry of Corrections is involved in an internal review of its information needs and has been unwilling to commit to the planned system.

Other funding bodies (e.g., the federal government, municipalities) have not been approached because they place minimal information demands on funded services and only require rudimentary service details (e.g., number of clients served) and financial statements.

System Sponsorship and Organizational Framework

There has been considerable debate about the longer term sponsorship and funding of the proposed system, but this issue has been deferred until this system is fully operational. At present, a unit with staff and resources dedicated to achieving the specific objectives set out in the proposal is administratively located within the Addiction Research Foundation.

Developmental Priorities

This system is being developed in three distinct phases. During the first phase, the focus has been on the client- and services-tracking system. Data elements and other critical features of this component have been determined and, to date, 156 agencies are participating in data collection to varying degrees.

Consistent with the provincial accountability framework, the second phase will focus on the development of a cost-monitoring component for client services. This will monitor direct and indirect services costs from the perspectives of funding bodies. Direct services costs are those incurred

Table 1

Core Components of the Provincial Accountability System

Major System Components	Level and Scope of Data Collection	Example(s) of Data Collected
Drug and Alcohol Registry of Treatment (DART)	Level: Agency Scope: Services provided Service availability Requests for information	Description of services provided by agencies Daily or less frequent reports of next available treatment slot Telephone enquiries regarding different service types from public and professionals
Utilization component	Level: Client Scope: Basic client and service data for all clients who receive direct services from participating agencies	Client demographics Service dates Type, amount, and duration of direct services received County of residence County of services delivery Discharge circumstances
Service cost component	Level: Worker Scope: All those providing client-specific services	Total personnel time spent providing (1) face-to-face or telephone services, (2) indirect service to clients (e.g., client-related travel, case notes), (3) administrative activities
	Level: Agency Scope: Ministry of Health–funded agencies	Personnel costs (including benefits) for individual staff members Overhead costs for the period of data collection
	Level: Client Scope: All services provided to or on behalf of all clients must be logged	The duration of services (by service type, program, and service provider) received by individual clients
Outcome component	Level: Client Scope: Follow-up a representative sample of clients who receive specialized addictions services	Comprehensive and standardized assessment information Detailed service activity information Client satisfaction Comprehensive follow-up information

in providing services to specific clients. They include salaries and benefits paid to the service provider during the services delivery episodes and the costs of any materials provided (e.g., drugs, booklets, forms, etc.). Indirect costs are those that cannot be associated with specific clients and include the time workers spend in department meetings, the salaries of support staff and directors, and the cost of the rent, utility bills, and the like. When agencies run multiple services, these indirect or overhead costs must be appropriately apportioned among different services.

A working group involving services providers was established to develop the costing component. A literature review was also undertaken, and experts in cost analysis were consulted. Pilot studies

involving 11 agencies have recently been completed, and a proposal for the full implementation of the cost component has been approved for pilot testing in conjunction with an assessment of client outcomes. This will be described in a subsequent paper. The full implementation of the cost component will be deferred until all agencies are accustomed to the client-tracking system. For some agencies, this is quite challenging enough, and some would be overwhelmed if requests for treatment cost estimates are made before the collection of standardized client and services information have become routine.

In the third and final phase, treatment outcome studies will be initiated. Working groups have already met to discuss outcome measures relevant to different types of agencies (detox, outpatient, assessment/referral, residential), and a literature review has been completed. A proposal for a series of follow-up studies involving clients from different types of agencies has been submitted for funding.

Client- and Service-Based Tracking Component

This component of the system involves the routine collection of basic client and services information. Data collection occurs at two points during a service episode. Client demographics and substance use details are collected at the first scheduled appointment attended. Discharge circumstances and the types and amount of services provided are recorded at the time of case closure.

A total of 75 data elements are collected for every case registered in the system. Cases include those seeking help for their own substance use problems and those seeking help for problems associated with substance use by a family member. Examples of specific data items and a rationale for their inclusion are summarized in Table 2.

Individual agencies have three options for participating in the client-tracking system: (1) completion of standard forms that are sent to the Addiction Research Foundation for data entry, (2) use of new software purchased for use in the project and provided at no cost to interested agencies, and (3) use of other software that meets the standards of the system. To date, the majority (72%) of agencies engaged in the system have opted to use the new software, and 8% are using paper forms.

Challenges to the Implementation of the Client-Tracking Component

Some widely shared concerns about information systems and their potential uses have been quite challenging during the design and implementation of the client-tracking system.[17] For example, many agency managers were, and some are still, skeptical that such a system will ever work, given the failure of several previous systems to win the support of services providers or to generate information of value to managers and planners. There is also an ongoing concern that information generated by the system will be misinterpreted and used to close agencies that appear relatively inefficient or ineffective because they serve clients with multiple presenting problems or operate in more difficult circumstances. Some services providers are also concerned that attempts to control costs will adversely affect the availability and quality of services.

Legitimate concerns that the system will negatively affect services delivery have also been expressed by some agency managers. Record keeping is seen as taking time from client services, and standardized performance indicators are viewed as insensitive to unpredictable and client-driven clinical practice.[18] Concerns that a standardized information system will require professional staff to submit to a rigid workload measurement system were expressed at the start, but these have proven to be unfounded.

Some managers are concerned that information about internal operations, such as staff workloads, could be misrepresented to funders or the public. Still others are concerned about breaching client confidentiality and contributing to a system that potentially enhances the power of the government

Table 2

Rationale for the Inclusion of Specific Data Items

Rationale for Inclusion of Data Items	Examples of Data Items
Provides information about priority populations as identified in the substance abuse strategy	Gender; county of residence; hearing, mobility, sight impairment (legally blind)
Required for record linkage or those items that constitute unique client identifiers	Health card number, initials at birth, birth date, postal code (first three digits), agency identification number
Addresses issues of quality assurance or internal validity checks	Primary worker's code; readmission status
Indispensable for demographic analysis	Age, gender, educational background, legal and primary employment status
Essential for standardizing recording procedures and obtaining standardized services delivery measurements across treatment sites	Level of engagement at discharge, reason for discharge, units and types of service provided, date of first and last direct service
Necessary for projecting service need	County of branch office/treatment site, client type, primary referral source
Monitors trends and substance use patterns overtime	Types of substances used in past year, major problem in substance and recent level of use, noninjection drug use
Necessary for aggregating data for client populations of interest to different provincial ministries	Legal status, major physical health condition, major mental health problem
Ensures system has capacity for expansion and accommodates local information needs	User-defined (optional) data items in registration and closure sections of client-recording form

to monitor the behavior of individual citizens. Finally, some agency managers who have invested heavily in computerized information systems have requested resources to modify existing systems in preference to using the software developed for the project.

A major issue that must be addressed in the development of any client-based management information system is the services delivery units to be monitored and, more important, the definition of these units to ensure standard reporting. In the substance abuse field, there is no widely accepted taxonomy of treatment services and settings. In the early stages of system design, it was decided to monitor four levels of services delivery: nonresidential, detoxification, short-term residential, and long-term residential. During the Rationalization Project, new service categories were added to accommodate a wider range of service types. The final set of services categories includes withdrawal management services (detox center), withdrawal management services (home/other setting), outpatient services, pretreatment (treatment preparation and planning), residential treatment, continuing care, and supportive services.

The Rationalization Project has also had a major impact on the design of the systems database. A major consequence of the project will be the merger of several treatment agencies in a district into one larger multifunctional agency. Integration of client record-keeping systems is anticipated in most mergers. Thus, rather than, say, five agencies reporting their admissions separately to the central

database, there may be only one agency reporting. This will significantly reduce the number of "admissions" to the treatment system, although the number of distinct individuals seen for treatment may be the same, higher, or lower after the merger. The use of the unique client identifier is critical to reduce all analyses to the level of individual clients rather than admissions. However, monitoring the number of "admissions" to treatment over time will be very difficult during the period of merger and services integration.

Another issue concerns the software to platform for the information system. Largely for reasons of economy, a single piece of software was designed and distributed across all participating agencies. The expectation was that this software would meet the needs of the provincial information system as well as participating agencies' needs for record keeping, workload monitoring, reports, and so on. Provision of this software to all participating agencies who chose this option had two unforeseen consequences. First, the project team was frequently asked to help resolve agencies' internal difficulties in system maintenance (e.g., computer networking problems) and to educate agencies in the use of the software for nonproject needs (e.g., generating internal agency reports). It became very difficult for the project team to draw a distinction between the needs of the provincial project and the needs of individual agencies. Later, as significant milestones in implementation were being missed, steps were taken to draw a clearer distinction and to refer agencies directly to the software vendor for issues that could be handled under their service contract. It has been difficult, however, to reduce the dependency of some agencies on the project team.

Second, in terms of uniformity in software, the speed with which management information software evolves is remarkably fast. While there were initially many advantages to encouraging agencies to use the standard piece of software, over the medium to long term this may prove to be inefficient as better software becomes available. For example, the project software is DOS based, and a Windows-based product is now preferred. In a rapidly changing software environment, it may be preferable to define the required data elements to be submitted to the central database in a standardized file format and leave decisions about hardware and software completely in the hands of the participating agency. Although this may prove more costly in the short run, there are clearly pros and cons to the issue of uniform software in the long term.

Implications for Behavioral Health Services

It is hoped that, in the long run, all specialized addiction agencies in Ontario will be routinely contributing standardized information on selected data to a centralized database. This will be a major achievement and will ensure that critical information is available for accountability and planning at the provincial, regional, and local levels. If successful, the province will have an addictions management information system that parallels systems in other jurisdictions and a database that will facilitate a variety of evaluation and health care evaluation projects. With the additional costing and outcome components, the system will represent the state of the art among addiction information systems.

Once the cost and outcome components are in place, the system will show which services are most cost-effective for particular groups of clients and show how resources could be redistributed to maximize the efficiency of the overall system. Because the Ontario system will involve a wide range of agencies and clients, the results will very likely generalize to parts of other publicly funded treatment systems, and they should be especially useful in jurisdictions where public funds for addiction treatment are limited or threatened with reductions. It is also hoped that the experience gained in the development of Ontario's addiction treatment information system will be of value to those considering the development of information systems in other jurisdictions with similar characteristics.

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