

Health Outcomes in Corrections: Health Information Technology and the Correctional Health Outcome and Resource Data Set (CHORDS)

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Introduction

Health information technology (HIT) is playing an increasingly important role in everyday health care. Hospitals, physician practices, and clinics are using electronic health record (EHR) systems to assist in delivering effective evidence-based patient care, providing needs-driven health care, improving service quality, and conducting research.

However, in the correctional environment, many jails and prisons do not have access to EHR systems or even access to the Internet. Perceived barriers to implementing HIT in corrections include concerns about data security and patient confidentiality. Moreover, HIT often competes with other institutional priorities for the limited resources that are available.

To elevate the overall quality of correctional health care, the National Commission on Correctional Health Care (NCCHC) is developing the Correctional Health Outcome and Resource Data Set (CHORDS), a uniform quality monitoring system for benchmarking and outcomes analysis. The explicit objective of CHORDS is to establish a national system for measuring performance in the correctional health care setting.

We believe that CHORDS can also help correctional facilities transition to HIT adoption and implementation by acclimatizing them to health outcome data collection procedures and performance measurements. This is particularly pertinent to jail settings, where budget constraints, technological barriers, and user resistance often pose severe impediments to HIT implementation.

Because CHORDS is neither a resource-intensive nor a technology-dependent tool, it may demonstrate to jails the benefits of collecting outcomes data and could motivate them to overcome barriers to HIT adoption.

Background Information

EHR systems can enhance clinical performance and patient outcomes in some areas of health care, including decision support for the diagnosis and management of disease (Anaraki et al., 2003). Benchmarking is considered to be the most effective way to use these data to improve performance, allowing providers to track and compare their performance over time with that of other providers in similar institutions.

Currently, however, there are no national outcome data sets for measuring performance in correctional health care. Such a data set could assist correctional systems in overcoming certain barriers associated with HIT adoption, and even generate interest in advancement. Additionally, such a system could support HIT integration, allow for the monitoring of outcomes, and improve the overall quality of care. Standardizing performance measures and allowing correctional facilities to assess their performance would improve health outcomes in a traditionally underserved population with a high prevalence of disease.

Computerized systems that support advanced functions such as EHRs, outcome analysis, and performance measurement tend to be quite costly, which is a serious barrier for many of the nation's 3,300 jails. Average daily populations of these facilities range from 10 to more than 10,000, and budgets generally are commensurate with the size of the facility. Because the population that cycles in and out of jails tends to have a high disease burden, with above-average rates of substance abuse and mental and chronic diseases, health care consumes a significant portion of the limited budgets that constrain so many jails.



Numerous expenditures are associated with HIT implementation, including the initial cost of hardware, software, and technical assistance, as well as licensing fees, maintenance, and the “opportunity cost” (e.g., staff time spent learning the system). To date, studies on the costs of HIT implementation tend to lump together all of the direct costs, but do not include estimates of indirect costs (e.g., reduced productivity during the early stages) (Congressional Budget Office, 2008). These costs are crucial when assessing HIT expenditures in corrections.

Cost is not the only barrier associated with HIT adoption; HIT implementation involves a major organizational commitment that lasts for several years. In order to take advantage of an HIT system, health professionals have to redesign the way they practice, as EHR systems are only as accurate as the data that are entered into them. Lack of qualified technicians to perform system maintenance can pose another challenge (Congressional Budget Office, 2008). In addition, the ability to transfer health information among systems and institutions is underdeveloped in the United States (Blumenthal, 2011).

All of these challenges apply to corrections and, if anything, may be accentuated. Using the CHORDS system, jails and prisons can begin to overcome some of the barriers to HIT implementation, enjoy some of its benefits, and lay the foundation for improved HIT as it becomes more widely available.

Health Information Technology in the Community

HIT can help improve health care quality, as demonstrated, for example, by both the Veterans Health Administration and Kaiser Permanente. By using HIT, the VA became one of the nation’s leading health care provider organizations, and Kaiser improved the care of patients with chronic disease (Blumenthal, 2011). In another example, in 2009, a pre-/post-intervention study assessed the effectiveness of automating diabetes interventions using an HIT system (Hunt et al., 2009). Results indicated favorable changes in outcome measures following implementation.

Studies also have shown that implementing EHRs can increase adherence to guidelines by health professionals,

improve the delivery of care, and reduce medication errors. EHR systems can also lead to improved efficiencies in medication administration, nursing, and other areas of clinical care (Leung, 2012). In addition to affecting costs and quality, electronic records can help address issues related to legibility, patient volumes, and the ability to retrieve relevant and accurate information during visits with health staff (Anaraki et al., 2003). All of these factors improve the efficiency and efficacy of the health care provided, increase access to online medical resources, and support collection of epidemiological data.

More broadly, electronic health systems provide many community and societal benefits, including research support, access to public health programs, and the creation of databases on which research and public health measures depend (Blumenthal, 2011). By supporting collection and reporting of publicly available outcomes data, they can also contribute to better informed decision-making by patients (Hunt et al., 2009).

However, a recent study conducted on HIT showed that only 1% of American hospitals have implemented the highest-performing software programs (Leung, 2012). As of 2008, only 12% of hospitals had basic or functioning EHRs (Blumenthal, 2011). Health care organizations need human resources to implement HIT, as well as a collaborative culture among staff (Leung, 2012). Studies in community settings have shown that use of EHRs can reduce duplication of tests and procedures, improve management of chronic conditions, and lower emergency room visits (Boyer, 2011). If the majority of hospitals and medical offices adopted HIT, it is estimated that the United States would save more than \$513 billion over 15 years (Boyer, 2011).

Health Information Technology in Corrections

In corrections, HIT could yield all of the benefits noted above. In addition, it could be used for disease surveillance. The principal use of disease surveillance in correctional facilities would be to monitor disease incidence, prevalence, and outcomes in the inmate population. Surveillance would include the collection of health data and the evaluation of the data collection system to

assist correctional health officials in characterizing the health status of the inmate population. The information obtained from surveillance could be used for evaluating and addressing the health needs of the inmate population, as well as the anticipated health needs of inmates upon release (National Commission on Correctional Health Care [NCCHC], 2002).

In the 2002 report to Congress on the Health Status of Soon-to-be-Released Inmates, experts recommended promoting surveillance of selected communicable diseases, chronic diseases, and mental illnesses among inmates, as well as the use of nationally accepted, evidence-based clinical guidelines for prisons and jails to ensure appropriate use of resources for preventing, diagnosing, and treating selected communicable diseases, common chronic diseases, and mental illnesses that are prevalent among inmates (NCCHC, 2002). A strong performance measurement system and a national correctional health care data set would provide an incentive for correctional systems to collect outcomes data in a standardized manner and help address these recommendations.

Research on the use of HIT in correctional systems is scant, and it appears to vary greatly. A 2009 study assessed the use of HIT and quality measurement at six prison systems (Damberg, Shaw, Teleki, Hiatt, & Asch, 2011). Only one was using an EHR system. The study found a wide range of technological sophistication among the facilities, which affected their ability to collect performance measurement data (Damberg et al., 2011). All the systems in the study experienced technological challenges to data collection and quality measurement. On the other hand, and perhaps more importantly, the study provided evidence that correctional systems can participate in performance measurement without an EHR. Prison systems implementing HIT seem to be experiencing the same challenges as community health care systems that are trying to use HIT effectively (Damberg et al., 2011).

The state of HIT in jails is even less advanced than that of prisons, and most information available is anecdotal.

Although a handful of jails are exploring ways to integrate HIT functions with existing administrative information systems or taking steps to join community health information exchanges, for the vast majority, this is unfamiliar and daunting territory.

The Patient Protection and Affordable Care Act supports adoption of new health information technologies, and the legislation's effects could very well influence the field of correctional health. That said, the use of HIT and electronic medical records warrants concerns about confidentiality and cost, especially in corrections, where funding depends upon already-strapped county or state budgets. Maintenance of these systems, as well as connecting them to statewide or county-wide health information exchanges, can be costly and time-consuming (Boyer, 2011).

Despite these challenges, correctional systems would be well served to begin adapting their practices to facilitate a transition to HIT. Standardized performance measurement is one tool that could support this transition while providing other benefits, and CHORDS is one such performance measurement tool.

CHORDS

CHORDS is modeled after the Healthcare Effectiveness Data and Information Set (HEDIS), which was developed by the National Committee for Quality Assurance (NCQA) as a performance data sharing system for health plans and providers. NCCHC aims to do the same for correctional health with CHORDS. Because an EHR system is not necessary to participate in CHORDS, nearly all correctional systems will have the ability to track, trend, and compare outcomes data over time.

The CHORDS project has the following objectives:

1. Establish standard performance measures for health care program evaluation.
2. Balance the current emphasis on policy and court compliance with patient outcome and resource data in order to support evidence-based care.

3. Standardize performance expectations.
4. Support implementation of primary care and quality improvement in correctional settings.
5. Contribute to public health and health services research.
6. Be a leading resource to correctional health care's involvement with national health care reform efforts.

NCCHC has engaged several leading correctional health care systems to demonstrate the feasibility and benefits of performance measurement through participation in a pilot program. This pilot is one of the first efforts under the broader CHORDS initiative. The program participants have developed a set of standardized measures and are providing data for the pilot study. Over a 12-month period, these systems, with the help of NCCHC, will refine the processes for data collection and reporting.

CHORDS Performance Measures

CHORDS is a quality improvement initiative that would use aggregate performance data and information and thus does not require the exchange of either protected health information or individually identifiable health information (Hubbert Systems Consulting, 2011). The specifications for these measures are based on nationally accepted performance measurement standards developed by the following health care organizations:

- Federal Agency for Healthcare Research and Quality (AHRQ)
- National Committee for Quality Assurance (NCQA)
- National Quality Forum (NQF)

HEDIS measures are divided into domains of care, and are revised annually. These domains include effectiveness of care, access, cost, and health plan stability. Like HEDIS, CHORDS aims to collect a variety of data eventually. The performance measures will evolve as the needs of the participants evolve.

The initial CHORDS performance measures focus on the care of diabetics. Each facility or system participating in the pilot has agreed to collect data using these measures. As this is uncharted territory in corrections, obstacles encountered in the collection of data and report genera-

tion will be discussed and resolved by the members of the steering committee. Currently, the focus of CHORDS is quality improvement through benchmarking. We expect that CHORDS will progress as the database grows, the processes evolve, new measures are added covering both disease outcomes and system processes, and an increasing number of participants discover new ways to use the data.

Quality measures are developed using consensus standards by the National Quality Forum (NQF) in order to measure health care processes and outcomes. Standard health care measures in the community typically anticipate longer periods of care than are reflected by patients in short-stay institutions such as jails. Therefore, short-stay measures have been adapted from NQF-endorsed measures in recognition of these temporal constraints. For example, in order to be included in the denominator, CHORDS short-stay measures (excluding medication management) require patients to be continuously incarcerated (enrolled) for at least 120 days during the study period, whereas NQF-endorsed measures require 365 days. Additionally, patients must not be incarcerated 45 days prior to the study period; NQF-endorsed measures do not use a filter for new patients.

Examples of CHORDS Short-Stay Measures:

- Hemoglobin A1c Retested for New Diabetes Patients Not in Good Control
- Hemoglobin A1c Improved for New Diabetes Patients Not in Good Control
- LDL-C Retested for Diabetes Patients Not In Good Control
- LDL-C Improved for Diabetes Patients Not In Good Control
- Medication Management for New Diabetes Patients Not in Good Hemoglobin A1c Control

Data are to be collected using standardized performance measures developed specifically for corrections and submitted electronically (initially using a formatted Excel spreadsheet). CHORDS datasets are to be stored in Excel spreadsheets, therefore minimizing the investment necessary to participate in the project. The data would be submitted to a central collection site, where

they would then be organized, and a customized, confidential report will be generated, with benchmarking data on similar, de-identified facilities.

Why CHORDS?

CHORDS should be a good fit for the correctional health care field because of its accessibility, low operating costs, and utility for quality improvement, regardless of a facility's resources. Many facilities and systems already collect performance measurement data without an EHR. For those facilities, CHORDS can support outcomes analysis.

As shown in the study by Damberg and colleagues (2011), there is a growing nationwide effort to standardize performance measures. Jails and prisons alike could participate in CHORDS, submitting data for either short-stay patients (jails) or long-stay patients (prisons). By standardizing and improving performance measures and allowing correctional facilities to assess their performance relative to similar facilities, CHORDS can support improvement of health outcomes in a traditionally underserved population with a high prevalence of disease.

CHORDS can also help prepare correctional health systems to adopt and use HIT to improve care. Having an EHR does not guarantee a higher level of care; it must be implemented as part of a broader quality improvement process (Millery & Kukafka, 2010). However, evidence shows that HIT can play a role in improving quality and addressing health disparities, which are disproportionately displayed in the incarcerated population.

The versatility of CHORDS eventually will allow for collection of a wide range of measures, and will be easily accessible through the Internet. CHORDS has the potential to transform correctional health and provide meaningful comparisons to the quality of care offered in the community.

CHORDS may also broaden public awareness of advancements in correctional health care and provide objective, established measures for use by government oversight bodies, correctional facility administrators, and the courts in measuring the efficiency and effectiveness of correctional health services.

Conclusion

We anticipate that CHORDS will fill a critical gap in the correctional health care field by establishing a national corrections-specific outcomes data set, and promoting and facilitating the use of performance measures whether or not a correctional facility has an EHR system. CHORDS could help correctional systems overcome barriers associated with HIT adoption by making performance measurement accessible and by meeting the needs of small and large facilities alike. Confidentially, and at an affordable cost, correctional systems could assess their performance relative to that of similar systems. CHORDS will also provide standard measures to guide the implementation of EHR collecting and reporting capabilities, and in some cases spark other technological advancements. Such a system could also improve outcome monitoring and overall continuity of care. For a correctional system, participating in CHORDS offers the potential not only for improving outcomes but also for moving closer to HIT adoption. In addition, CHORDS should promote awareness of advancements in the field and provide standardized performance measures for oversight bodies. Ultimately, this should contribute to improved quality of care across the field of correctional health.

References

- Anaraki S, Plugg E and Hill A. "Delivering Primary Care in Prison: The Need to Improve Health Information." *Informatics in Primary Care*, 11: 191-194, 2003.
- Blumenthal D. "Wiring the Health System—Origins and Provisions of a New Federal Program." *New England Journal of Medicine*, 365: 2323-2329, 2011.
- Boyer K. "The Technology Promise: Widespread Use of Electronic Medical Records Promises to Transform Health Care. But Can We Afford It?" Washington: National Conference of State Legislatures, October 2011, www.ncsl.org/issues-research/health/the-technology-promise.aspx (accessed February 2012).
- Congressional Budget Office. *Evidence on the Costs and Benefits of Health Information Technology*, 2008.
- Damberg CL, Shaw R, Teleki SS, Hiatt L and Asch SM. "A Review of Quality Measures Used by State and Federal Prisons." *Journal of Correctional Health Care*, 17: 122-137, 2011.
- Hubbert Systems Consulting. *CHORDS Demonstration Guidance Document*. Gold River, CA, 2011.
- Hunt J, Siemienczuk J, Gillanders W, LeBlanc B, Rozenfeld Y, Bonin K, et al. "The Impact of a Physician-Directed Health Information Technology System on Diabetes Outcomes in Primary Care: A Pre- and Post-implementation Study." *Informatics in Primary Care*, 17: 165-74, 2009.
- Leung RC. "Health Information Technology and Dynamic Capabilities." *Health Care Management Review*, 37: 43-53, January 2012.
- Millery M and Kukafka R. "Health Information Technology and Quality of Health Care: Strategies for Reducing Disparities in Underresourced Settings." *Medical Care Research and Review*, 67: 268-298, 2010.
- Minton TD. *Jail Inmates at Midyear 2010 - Statistical Tables*. US Department of Justice, Bureau of Justice Statistics, NCJ 233431, 2011.
- National Commission on Correctional Health Care. *The Health Status of Soon-to-be-Released Inmates*. Chicago, IL: Author, 2011.
- Measuring Performance. Washington: National Quality Forum, www.qualityforum.org/Measuring_Performance/Measuring_Performance.aspx (accessed February 2012).