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A Tool for Tracking and Assessing Chronic Illness Care in Prison (ACIC-P)

Emily A. Wang, MD, MAS¹, Jenerius A. Aminawung, MD, MPH¹, Warren Ferguson, MD², Robert Trestman, PhD, MD³, Edward H. Wagner, MD, MPH⁴, and Carol Bova, PhD⁵

¹ Department of Medicine, Yale University School of Medicine, New Haven, CT, USA

² Department of Family Medicine & Community Health, University of Massachusetts Medical School, Worcester, MA, USA

³ Correctional Managed Health Care and the Department of Medicine, University of Connecticut Health Center, Farmington, CT, USA

⁴ Group Health Research Institute, Seattle, WA, USA

⁵ Department of Medicine and Nursing, University of Massachusetts Medical School, Worcester, MA, USA

Abstract

Chronic disease care is being transformed in correctional settings, given an aging inmate population, ongoing quality improvement efforts, litigation, and rising costs. The Chronic Care Model, established for chronic disease care in the community, might be a suitable framework to transform chronic disease care in prison, but it has not been systematically adapted for the correctional health care setting. We employed cognitive interviewing to adapt an extant survey used to measure the delivery of chronic illness care in the community, Assessment of Chronic Illness Care, for a prison setting. Results from the cognitive interviews and the modified Assessment of Chronic Illness Care–Prison (ACIC-P) instrument are presented in this article. Future studies will need to test the reliability and psychometric properties of the adapted ACIC-P.

Keywords

prison health care; chronic care model; quality improvement; chronic disease

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Corresponding Author: Emily A. Wang, MD, MAS, Section of General Internal Medicine, Yale University School of Medicine, Harkness Hall Building A, Suite 410A, 367 Cedar Street, New Haven, CT 06510 USA. emily.wang@yale.edu.

Authors' Note

Emily Wang, Jenerius Aminawung, and Carol Bova had full access to all of the data in the study. Emily Wang, Robert Trestman, and Warren Ferguson were responsible for the conception of this work. All the authors participated in the study design and analysis and interpretation of the data, reviewed the article's intellectual content, and provided critical revisions.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Introduction

Being incarcerated in the United States is the only circumstance where primary health care is constitutionally guaranteed (*Estelle v. Gamble*, 1976). Correctional facilities provide many individuals with their first access to health care as adults and can shape their future health care practices. It is estimated that 80% of prisoners see a health care provider when incarcerated, and 30% to 50% are diagnosed with a new chronic condition (Desai, Latta, Spaulding, Rich, & Flanigan, 2002; Maruschak, 2008). Approximately 80% of prisoners have a chronic medical, psychiatric, and/or substance abuse condition that warrants long-term, comprehensive care (Mallik-Kane & Visher, 2008). Furthermore, with a growing population of older prisoners, the prevalence of chronic diseases of aging is expected to increase in prison (Williams, Goodwin, Baillargeon, Ahalt, & Walter, 2012; Williams et al., 2010).

In spite of the heavy disease burden, prisons are not designed to provide chronic disease care. To start, the overall mission of the criminal justice system is to protect public safety and reduce recidivism, not to improve individual and community health. Prisons are not designed to manage chronic medical conditions; some prisons do not have adequate clinic space (Kelso, 2008). Standards for correctional health care are variable across prison health care systems because systems can use different and multiple guidelines from correctional, medical, and public health organizations (American Diabetes Association, 2009; National Commission on Correctional Health Care [NCCHC], 2014; U.S. Department of Justice, 2008). The quality of care in prison is also variable, in part due to profit motives or limited state budgets (Bedard & Frech, 2009; MacReady, 2009), but there are studies suggesting that HIV-infected patients have better health outcomes while in prison than in the community (Springer et al., 2004). Many state governments do enforce basic standards of medical care, though these do not include public reporting of health outcomes nor is receipt of state funding dependent on patient outcomes, as it is in the community.

Nonetheless, prison systems, including Texas, Missouri, and California, collect and publicly report data on the quality of care provided by their correctional health care systems (Asch et al., 2011). NCCHC has started the Correctional Health Outcomes and Resource Data Set, a volunteer project in which 56 prisons participate to track nine diabetes-related performance measures adapted from the Healthcare Effectiveness Data and Information Set used in community health care settings. A number of correctional institutions have ongoing chronic disease quality improvement projects (Damberg, Shaw, Teleki, Hiatt, & Asch, 2011). For instance, the California prison system has begun to implement the well-established Chronic Care Model used in community health care settings to improve chronic disease care at the patient, practice, and organizational levels (Ha & Robinson, 2011). The Chronic Care Model outlines six basic elements for improving chronic disease care in health systems, including self-management strategies, community linkages, delivery system redesign, decision support, clinical information support, and health system support (Bodenheimer, Wagner, & Grumbach, 2002; Coleman, Austin, Brach, & Wagner, 2009; Wagner, 2004; Wagner et al., 2001). While survey instruments have been designed to measure how well health care organizations provide care for individuals with chronic disease in each of these six domains,

these were originally designed for community health care settings and have not been adapted for correctional settings.

Without valid instruments to measure how well prison health care settings are designed to deliver chronic disease care, systems will be unable to empirically design and test interventions intended to improve the delivery of chronic disease care. Thus, we aimed to adapt an extant survey used to measure the delivery of chronic disease care in the community, the Assessment of Chronic Illness Care (ACIC; Bonomi, Wagner, Glasgow, & VonKorff, 2002). The ACIC is a tool designed to help primary care organizations assess how well they are providing chronic illness care in each of the six components of the chronic care model. As a first step to adapting the survey, we used cognitive interviewing to improve the content validity of the survey. In addition to the modified ACIC-P instrument, study results from the cognitive interviews and content analyses are presented in this article.

Methods

We chose to use cognitive interviewing, widely recognized as a critical step in health-related questionnaire development, to modify the ACIC for the prison setting (see Figure 1; Willis, 2005; Willis, Royston, & Bercini, 1991). To do so, we convened three correctional health leaders to rate the applicability and clarity of the ACIC in the context of correctional health and help design interview probes for the cognitive interviews. We then conducted cognitive interviews to assess how well a sample of 12 prison providers and administrators interpreted and answered the ACIC items, thus enhancing the content validity of the questions.

Assessment of participant interpretation and understanding of questionnaire items was conducted through the think-aloud method or verbal probing (Ericson & Simon 1980, 1984). We recorded and transcribed each of the interviews so that we could systematically review and code responses to each item on the survey and alter the survey to create the ACIC-P. The next phase of this study will examine the psychometric characteristics of the adapted instrument.

Study Population

We invited prison health care providers and key administrators from a single northeastern state prison system to participate in the study. The medical director of the prison system solicited participation through a staffwide email and followed up during a monthly staff meeting. For the cognitive interviews, although participant characteristics may be associated with item interpretation, the anticipated small number of participants for this step makes it difficult to propose a representative sample. However, since we are especially concerned with differences in type of provider and length of practice in the correctional setting, we established a priori criteria for item evaluation by members across these groups. All participants provided verbal consent. We offered a US\$20 gift voucher as compensation for participants' time. The institutional review boards of the University of Massachusetts and Yale University approved the study protocol and deemed the study exempt from full review.

ACIC

The ACIC is a 34-item, self-administered tool designed to help primary care organizations assess how well they are providing chronic illness care in each of the six components of the Chronic Care Model—self-management support, linkages to community resources, decision support, delivery system design, clinical information systems, and organization of the health system. Responses to the ACIC questions fall within the range of a 0 to 11 scale, with categories defined as follows: 0 to 2 (*little or no support for chronic disease care*), 3 to 5 (*basic or intermediate support for chronic disease care*), 6 to 8 (*advanced support for chronic disease care*), and 9 to 11 (*optimal, or comprehensive, integrated care for chronic disease*). The ACIC instrument has been used in large multicenter studies to improve chronic illness care in community health centers and has been shown to be sensitive to organizational change (Bonomi et al., 2002). It has been used as a metric of organizational quality improvement for asthma, hypertension, and diabetes care and, in a few studies, improvement in patient outcomes. One study reported a 1-point increase in the ACIC score to be associated with a 16% relative decreased risk of coronary heart disease (Parchman, Zeber, Romero, & Pugh, 2007).

Cognitive Interview Probes

With input from three correctional health care leaders, we designed semistructured interview probes to process responses to the ACIC questions (see Table 1). The interview script included items to facilitate both guided “thinking aloud” and verbal probing technique, but interviewers were also instructed to use spontaneous probes when appropriate. Standard probes included items such as “Tell me what you were thinking as you heard this question.” Additional probes were tailored to the stem and response components of a particular item, for instance, “What does the phrase ‘business plans’ mean to you? How does it apply to the correctional health system?”

Procedures for Cognitive Interviews

All three interviewers (E.W., J.A., and C.B.) underwent a training session to ensure similar procedures, which included a pilot interview of a correctional health administrator. We conducted 11 cognitive interviews with correctional health care providers. After obtaining verbal consent, we asked participants to complete the ACIC questionnaire in a paper-and-pencil format and to make notes on the survey instrument for items that were unclear or not applicable to the correctional health care system. We also collected information about participants’ basic demographics and experience of working in a correctional health care system. We employed the intensive verbal probing technique using our interview probes after each participant completed the ACIC instrument to infer participant understanding and interpretation of the ACIC items (Willis, 2005). Participants were asked to address the following three main topics: clarity of instructions, content of candidate items, and response format for each ACIC item. First, we asked the participants whether they had any specific items they identified to be problematic. For such items, we asked participants to state their understanding of the item and provide suggestions to improve the item, if any. Using the developed interview probes, we then assessed participants’ understanding and interpretation of the items determined by the investigators to be areas of potential confusion, given the

differences between the correctional and community health care systems. The final probe was a general question, “What thoughts came to mind after going through the entire ACIC instrument?” All interviews were conducted in a quiet, private office space and lasted, on average, 45 minutes. The interviews were tape recorded and professionally transcribed.

We conducted three rounds of interviewing as a means of testing, modifying, and retesting the interview probes to reach thematic saturation for the ACIC items identified as problematic. We conducted six interviews in the first round, three in the second, and two interviews in the third round. After each round, we conducted a brief review of our field notes and discussion of the main findings of the session. This provided initial verification of main findings and interpretations. Any items that were ambiguous were altered to clarify the wording, or a probe was added or modified to elicit clarity for the item. After these revisions, we conducted an additional interview with a prison provider in another state prison system to confirm our findings.

Analysis

Three study authors reviewed each interview transcript independently and regularly during ongoing decisions about questionnaire revisions. This iterative process allowed our team the opportunity to address issues before or during subsequent interviews. Building on the work of Tourangeau and Willis, we focused on four problem types in cognitive processing and developed a coding system for formal analysis of probed interviews (Tourangeau, 1984; Willis et al., 1991). The first problem type was *comprehension/communication*, where respondents did not understand the terminology used. The second was a *recall/computation* problem, which is a retrieval process wherein respondents have difficulty in remembering a selected period of time. A third type of problem was *bias/sensitivity* and is related to respondents’ judgment process. Finally, the fourth type of problem was *response*, when respondents are unable to connect their own responses to the answer categories in the instrument. We identified characteristic quotes to exemplify each of these types of problems. We also tracked the frequency of problems, but these data should be analyzed cautiously, given that this study’s primary objective was to use cognitive interviewing to improve the content validity of the survey for use in the prison health care system.

Results

Twelve health care providers and administrators completed the study; one study participant did not answer questions on demographics. There were six female and two non-White respondents. The mean age was 46 years (range 27 to 67). Five were physicians, four were nurses or nurse practitioners, and two were physician assistants. Physician specialties included internal medicine and family medicine. Five interviewees also had administrative responsibilities. The median length of time participants had worked in correctional health was 10.3 years (range 0.5 to 17 years) and in their current prison institution was 9 years (range 0.5 to 17 years).

Most participants felt that the ACIC instrument was a useful tool to assess chronic illness care. In addition, many thought it represented a sort of ideal for chronic care and that, though unrealistic in correctional health, it could be used as a target for correctional health

leaders to aim toward. Participants, however, found some of the terminology to be problematic for the correctional health care setting and expressed concerns that some ACIC item responses would be different depending on the security level of the correctional institution. Table 2 provides examples of the most common problems and specific issues identified.

Analyses of the participant responses yielded two of the four major problems in the cognitive process: *comprehension* and *response*, as opposed to *recall* or *bias*. Participants did not understand the questions because of unfamiliar language and uncertainty about the meanings of specific words. For example, some participants did not understand the term “practice teams” and did not know whether “senior leaders” referred to “administrative leadership” or “the doctor at my medical center.” A common source of confusion also emerged regarding referrals to “outside resources,” “community organizations,” or “community groups” and whether these referred to discharge planning before release from prison or referrals to community organization during the period of incarceration. For example, one participant described linking patients to “outside resources” as “something that’s done when an inmate is being discharged to outside,” while others interpreted this as “specialty providers.”

ACIC items for which participants had varied interpretations were considered ambiguous and were replaced. For example, to resolve the ambiguity of the term “senior leaders,” we split “senior leaders” into two distinct categories: “executive leaders” and “clinical leaders.” Items on community linkages were also replaced because of the varied interpretations. Based on participants’ responses, we defined many types of clinical linkages important to chronic disease care, including behavioral health, specialty care, and community-based organizations. Items for which participants expressed a need for clarity were modified. For example, one participant remarked, “I’m not sure [practice team] is a familiar term used in corrections,” so we changed the term to “multidisciplinary clinical team.” A significant minority of participants had not heard of the term self-management support or did not feel that correctional health systems could achieve this. However, most felt that changes could be made in prisons to enhance chronic disease self-management and self-management support, but that it would have to be context specific. For instance, while patients may not be able to have access to the Internet, glucometers, or insulin syringes, as they do in the community, there perhaps could be correctional facility-specific mechanisms by which health care providers and clinics could teach self-management support. One provider suggested the idea of teaching patients how to make good decisions regarding diet through commissary purchases or building organic gardens in prison. Others discussed creating appropriate exercise interventions or improving access to dietitians in prison. Similar responses were elicited with discussions of an electronic registry. All participants saw the utility of an electronic registry, but many commented that most prison systems were far from having an electronic health record or a registry. Thus, both self-management support and the registry were kept within the survey.

Other problems were coded as problems with *response*. One example of this was a question focused on “addressing concerns of patients and families.” Many participants indicated that they “don’t deal with families,” so they “ignored” that part of the question. Also,

participants noted that some item responses were not applicable in corrections, such as the ability to contact patients by “email or phone.” We eliminated both of those sections and others that were not pertinent to prison health care systems.

Finally, some participants noted that there were parts of chronic disease care in prisons that were not at all captured by the ACIC instrument. A number of respondents indicated that even the practice team, or the multidisciplinary clinical team, ought to include correctional officers since they are responsible for transporting patients and in certain correctional facilities work quite closely with the health care staff (e.g., on infirmary units or units that house chronically ill patients). Similarly, others mentioned that correctional facility leadership recognizing the importance of chronic disease care was central to delivering high-quality care. One participant remarked, “... if you have a guy with chest pain, well not only are you working with the doctor to talk it over, but you’re also working with the correctional officer to make sure there is security, you’re talking with the shift commander and captain to see if you can get him out, you’re talking with the hospital.” Also, a number of participants commented on a unique component of chronic disease care, namely, planning for release back to the community. For these elements, since there were no comparable questions in the original ACIC instrument, we added two new questions to the ACIC using the same format as the others. The question on custody was added to the section on Organization of Healthcare System and the question on discharge planning was added to the section on Other Clinical Linkages. Some participants also acknowledged that many individuals return to prison and thus continuity ought to include transitions from the community back to prison, but we did not add a question to the instrument to address return to the prison health care system.

In all, 15 (44%) of the ACIC items did not require any changes. We made some modifications or added clarifications to 13 (38%) of the items. Six questions were changed completely to reflect the various organizational layers of administration and add specificity to the items under other clinical linkages and two new questions on the role of custody and discharge planning were added. The final instrument, ACIC-P, is a 36-item questionnaire. Similar to the original ACIC, the scores range from 0 to 11, with a lower score indicating less organizational support for chronic illness care (see Appendix).

Discussion

We created the ACIC-P instrument using cognitive interviewing, illustrating how cognitive interviewing techniques can assist clinicians and clinical researchers in enhancing the quality of measurement instruments typically used in the community health care setting for the prison health care system. This study identified several areas of concern in the original ACIC instrument, specifically the use of unfamiliar language, use of words without universal meaning for the correctional health care system, contextual differences that may be culturally based, and answer categories that did not fit into internally generated response categories. These results demonstrate that prison health care systems present challenges to the conceptual model of the primary care medical home for patients with a history of incarceration. Unlike community health care settings, more than 95% of patients will be released from prisons and leave the correctional health care system, suggesting that a

medical home for patients with a history of incarceration should reflect that care spans multiple settings including specialty practices and hospitals where patients are referred while incarcerated but also primary care and specialty practices when they are released.

While cognitive interviewing is widely recognized as a critical step in the development of health-related questionnaires, many studies of prisoners or of the prison health care system use ad hoc means to alter extant surveys designed for community dwellers or the community health care system. This study indicates that cognitive interviewing may be a useful method for adapting validated instruments used in the community for use in correctional health care settings. By clarifying the meaning and improving comprehension of questions' intent and/or meaning, survey errors related to misinterpretation were potentially avoided. To our knowledge, this is the first published study to document the cognitive testing of an existing survey for adaptation for the prison health care setting. This study demonstrated the feasibility of using cognitive interviewing for modifying extant health care surveys used primarily in community health care settings using limited resources, particularly tailoring the questionnaire items to the vocabulary and choices of the target population first and then performing the cognitive interviewing process. Future studies will involve testing the reliability of the ACIC-P and using the survey pre- and postinterventions designed to improve chronic illness care.

Some limitations should be acknowledged. First and foremost, this study was conducted primarily in a single prison system. We did not include prison health care providers from rural settings, private prisons, jails, or juvenile detention centers, which may have significantly different chronic disease care practices and organizational structures. Another limitation of the study is that we tested the ACIC items with a relatively limited sample of participants. While this sample size yielded good thematic saturation, having a larger sample size may have yielded more diverse responses, especially if we had included younger providers and those with varied experiences practicing in both the community and the prison system.

In light of a new focus on chronic illness care in the prison system, we modified the ACIC instrument used in the community for prison health care systems using cognitive interviews. What emerged is an instrument that is more reflective of the unique attributes of the prison health care system. This technique can be integrated with other strategies for translation and survey development to optimize items for criminal justice settings and populations.

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Appendix

Assessment of Chronic Illness Care-PRISON
Please complete the following information about the correctional health system in which you practice. The purpose of this survey is to gain an understanding of how chronic illness care is provided within your correctional health system and how best to improve the quality of care. Read "Directions for Completing the Survey" and then answer the questions from the perspective of the correctional health site in which you work. The information you provide will not be disclosed to anyone besides the study team. Thank you.
Date: ____/____/____ Month Day Year
Directions for Completing the Survey
This survey is designed to help systems and provider practices move toward the "state-of-the-art" in managing chronic illness. The results can be used to help your team identify areas for improvement. Instructions are as follows:
<ol style="list-style-type: none"> 1. Answer each question regarding how your clinic is doing with respect to the care provided to persons with a chronic disease 2. For each row, circle the point value that best describes the level of care that currently exists in the site. The rows in this form present key aspects of chronic illness care. Each aspect is divided into levels showing various stages in improving chronic illness care. The stages are represented by points that range from 0 to 11. The higher point values indicate that the actions described in that box are more fully implemented. 3. Sum the points in each section (e.g., total part I score), calculate the average score (e.g., total part I score/# of questions), and enter these scores in the space provided at the end of the survey. Then sum all of the average section scores and divide by 7. The total score should be between 0 and 11.
For more information about how to complete the survey, please contact:
Emily Wang, MD, MAS Yale University School of Medicine e-mail: emily.wang@yale.edu

Assessment of Chronic Illness Care-Prison, Version 1.0

Part I: Organization of the Healthcare Delivery System. Chronic illness management programs can be more effective if the overall system (organization) in which care is provided is oriented and led in a manner that allows for a focus on chronic illness care.

Components	Level D	Level C	Level B	Level A
I-1: Executive leaders	...are focused on short-term business priorities.	...visibly support and create an infrastructure for chronic illness care, but do not commit resources.	...allocate resources and actively reward chronic illness care initiatives.	...support continuous learning throughout the organization, review and act upon quality data, have a strategy and funding commitment to explore, implement chronic illness care.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-2: Organizational Goals for Chronic Care	...do not exist or are limited to one condition.	...exist but are not actively reviewed.	...are measurable and reviewed.	...are measurable, reviewed routinely, and are incorporated into plans for improvement.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-3: Improvement Strategy for Chronic Illness Care	...is ad hoc and not organized or supported consistently.	...utilizes ad hoc approaches for targeted problems as they emerge.	...utilizes a proven improvement strategy for targeted problems.	...includes a proven improvement strategy and uses it proactively in meeting organizational goals.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-4: Regulations for Chronic Illness Care	...are not used to influence clinical performance goals.	...are used to influence utilization and performance of chronic illness care.	...are used to support patient care goals.	...are used to motivate and empower providers to support patient care goals.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-5: Clinical leaders	...intermittently focus on chronic illness care.	...have developed a vision for chronic illness care, but no consistent process for getting there.	...are committed to chronic illness care, and sometimes engage teams in problem solving and implementation.	...consistently champion and engage clinical teams in improving patient experience of care and clinical outcomes.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-6: Custody	...intermittently focuses on chronic illness care.	...has developed a vision for chronic illness care, but no consistent process for getting there.	...is committed to chronic illness care, and sometimes engages teams in implementation and problem solving.	...consistently champions and engages clinical teams in improving patient experience of care and clinical outcomes.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
Components	Level D	Level C	Level B	Level A
I-7: The organization's hiring and training processes (of health care providers)	...focus only on the narrowly defined functions and requirements of each position.	...reflect how potential hires will affect the culture and participate in chronic illness care activities	...place a priority on the ability of new and existing staff to improve chronic illness care and create a patient-centered culture.	...support and sustain improvements in chronic illness care through training and incentives focused on rewarding patient-centered care.
Score	0 1 2 3 4 5	6 7 8	9 10 11	

Part 2: Other Clinical Linkages. Linkages between the health delivery system (or provider practice) and other resources (behavioral, mental, and medical specialty services) play important roles in the management of chronic illness.

Components	Level D	Level C	Level B	Level A
2-1: Medical and surgical specialty services	...are difficult to obtain reliably.	...are available from community specialists but are neither timely nor convenient.	...are available from community specialists and are generally timely and convenient.	...are readily available from specialists who are members of the care team or who work in an organization with which the practice has a referral protocol or agreement.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2-2: Behavioral health services	...are difficult to obtain reliably.	...are available from mental health specialists but are neither timely nor convenient.	...are available from specialists and are generally timely and convenient.	...are readily available from behavior health specialists who are onsite members of the care team or who work in an organization with which the practice has a referral protocol or agreement.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2-3: Linking patients to community resources in prison (health education)	...is not done systematically.	...is limited to providing patients a list of identified resources in an accessible format.	...is accomplished through a designated staff person or resource responsible for connecting patients with resources.	...is accomplished through active coordination between the health system, agencies and patients and accomplished by a designated staff person.
Score	0 1 2	3 4 5	6 7 8	9 10 11
2-4: Linking patients to medical resources after discharge from prison	...is not done systematically.	...is limited to providing patients a list of identified resources in an accessible format.	...is accomplished through a designated staff person or resource responsible for connecting patients with resources.	...is accomplished through active coordination between the health system, agencies and patients and accomplished by a designated staff person.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Part 3: Practice Level. Several components that manifest themselves at the level of the individual provider practice (e.g., individual clinic) have been shown to improve chronic illness care. These characteristics fall into general areas of patient self-management support, delivery system design issues that directly affect the practice, decision support, and clinical information systems.

Part 3a: Patient self-management support. Effective patient self-management support can help patients and families cope with the challenges of living with and treating chronic illness and reduce complications and symptoms.

Components	Level D	Level C	Level B	Level A
3-1-1: Assessment and Documentation of Patient Self-management Needs and Activities	...are not done.	...are expected.	...are completed in a standardized manner.	...are regularly assessed and recorded in standardized form linked to a treatment plan available to practice and patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-1-2: Patient Self-management Support	...are limited to the distribution of information (pamphlets, booklets) or not available	...are available by referral to patient self-management classes or educators.	...are provided by trained clinical educators who are designated to do patient self-management support, affiliated with each practice, and see patients on referral.	...are provided by clinical educators affiliated with each practice, trained in patient empowerment and problem-solving methodologies, and see most patients with chronic illness.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-1-3: Addressing Concerns of Patients Regarding Self-Management	...is not consistently done.	...is provided for specific patients through referral.	...is encouraged, and peer support, groups, and mentoring programs are available.	...is an integral part of care and includes systematic assessment and routine involvement in peer support, groups or mentoring programs.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-1-4: Effective Behavior Change Interventions and Peer Support	...are not available.	...are limited to the distribution of pamphlets, booklets or other written information.	...are available only by referral to specialized centers staffed by trained personnel.	...are readily available and an integral part of routine care.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Part 3b: Decision Support. Effective chronic illness management programs assure that providers have access to evidence-based information necessary to care for patients—decision support. This includes evidence-based practice guidelines or protocols, specialty consultation, provider education, and activating patients to make provider teams aware of effective therapies.

Components	Level D	Level C	Level B	Level A
3-2-1: Evidence-Based Guidelines	... are not available or not updated.	... are available but are not integrated into care delivery.	... are available and supported by provider education.	... are available, supported by provider education and integrated into care through reminders and other proven provider behavior change methods.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-2-2: Involvement of Specialists in Improving Primary Care	... is primarily through traditional referral.	... is achieved through specialist leadership to enhance the capacity of the overall system to routinely implement guidelines.	... includes specialist leadership and designated specialists who provide primary care team training.	... includes specialist leadership and specialist involvement in improving the care of primary care patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-2-3: Provider Education for Chronic Illness Care	... is provided sporadically.	... is provided systematically through traditional methods.	... is provided using optimal methods (e.g., face to face education of providers by trained professionals on evidence based practice).	... includes training all multidisciplinary clinical teams in chronic illness care methods, such as population-based management and patient self-management support.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-2-4: Informing Patients about Guidelines	... is not done.	... happens on request or verbally.	... is done through specific patient education materials for each guideline.	... includes specific materials developed for patients which describe their role in achieving guideline adherence.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Part 3c: Delivery System Design. Evidence suggests that effective chronic illness management involves more than simply adding additional interventions to a current system focused on acute care. It may necessitate changes to the organization of practice that impact provision of care.

Components	Level D	Level C	Level B	Level A
3-3-1: Multi-disciplinary Clinical Team Functioning	... is not addressed.	... is addressed by assuring the availability of individuals with appropriate training in key elements of chronic illness care.	... is assured by regular team meetings to address guidelines, roles and accountability, and problems in chronic illness care.	... is assured by teams who meet regularly and have clearly defined roles including patient self-management education, proactive follow-up, and resource coordination and other skills in chronic illness care.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-3-2: Multi-disciplinary Clinical Team Leadership	... is not recognized locally or by the system.	... is assumed by the organization to reside in specific organizational roles.	... is assumed by the appointment of a team leader but the role in chronic illness is not defined.	... is guaranteed by the appointment of a team leader who assures that roles and responsibilities for chronic illness care are clearly defined.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-3-3: Appointment System	... can be used to schedule acute care visits, follow-up and preventive visits.	... assures scheduled follow-up with chronically ill patients.	... is flexible and can accommodate innovations such as customized visit length or group visits.	... includes organization of care that facilitates the patient seeing multiple providers in a single visit.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-3-4: Follow-up	... is scheduled by patients or providers in an ad hoc fashion.	... is scheduled by the practice in accordance with guidelines.	... is assured by the multidisciplinary clinical team by monitoring patient utilization.	... is customized to patient needs, varies in and assures guideline follow-up.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-3-5: Planned Visits for Chronic Illness Care	... are not used.	... are occasionally used for complicated patients.	... are often used for complicated patients.	... are used for all patients and include regular assessment, preventive interventions and attention to patient self-management support.
Score	0 1 2	3 4 5	6 7 8	9 10 11
3-3-6: Continuity of Care	... is not a priority.	... depends on written communication between primary care providers, specialists, and case managers.	... between primary care providers and specialists and other relevant providers is a priority but not implemented systematically.	... is a high priority and all chronic disease interventions include active coordination between primary care, specialists and other groups.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Part 3d: Clinical Information Systems. Timely, useful information about individual patients and populations of patients with chronic conditions is a critical feature of effective programs, especially those that employ population-based approaches.

Components	Level D			Level C			Level B			Level A		
3-4-1: Registry (list of patients with specific conditions)	... is not available.			... includes name, diagnosis, contact information and date of last contact either on paper or in a computer database.			... allows queries to sort sub-populations by clinical priorities.			... is tied to guidelines which provide prompts and reminders about needed services.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
3-4-2: Reminders to Providers	... are not available.			... include general notification of the existence of a chronic illness, but does not describe needed services at time of encounter.			... includes indications of needed service for populations of patients through periodic reporting.			... includes specific information for the team about guideline adherence at the time of individual patient encounters.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
3-4-3: Feedback	... is not available or is non-specific to the team.			... is provided at infrequent intervals and is delivered impersonally.			... occurs at frequent enough intervals to monitor performance and is specific to the team's population.			... is timely, specific to the team, routine and personally delivered by a respected opinion leader to improve team performance.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
3-4-4: Information about Relevant Sub-groups of Patients Needing Services	... is not available.			... can only be obtained with special efforts or additional programming.			... can be obtained upon request but is not routinely available.			... is provided routinely to providers to help them deliver planned care.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
3-4-5: Patient Treatment Plans	... are not expected.			... are achieved through a standardized approach.			... are established collaboratively and include self management as well as clinical goals.			... are established collaboratively and include self management as well as clinical management. Follow-up occurs and guides care at every point of service.		
Score	0	1	2	3	4	5	6	7	8	9	10	11

combine all elements of the chronic care model; for example, linking patients' patient self-management goals to information systems/registries.

Components	Little support			Basic support			Good support			Full support		
4-1: Informing Patients about Guidelines	... is not done.			... happens on request or through system publications.			... is done through specific patient education materials for each guideline.			... includes specific materials developed for patients which describe their role in achieving guideline adherence.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
4-2: Information Systems/Registries	... do not include patient self-management goals.			... include results of patient assessments (e.g., functional status rating; readiness to engage in patient self-management activities), but no goals.			... include results of patient assessments, as well as patient self-management goals that are developed using input from the multidisciplinary clinical team/provider and patient.			... include results of patient assessments, as well as patient self-management goals that are developed using input from the multidisciplinary clinical team and patient; and prompt reminders to the patient and/or provider about follow-up and periodic re-evaluation of goals.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
4-3: Other Clinical Programs (behavioral, mental and medical specialty services)	... do not provide feedback to the health care system/clinic about patients' progress in their programs.			... provide sporadic feedback at joint meetings between other clinical care agencies and health care system about patients' progress in their programs.			... provide regular feedback to the health care system/clinic using formal mechanisms (e.g., Internet progress report) about patients' progress.			... provide regular feedback to the health care system about patients' progress that requires input from patients that is then used to modify programs to better meet the needs of patients.		
Score	0	1	2	3	4	5	6	7	8	9	10	11
4-4: Organizational Planning for Chronic Illness Care	... does not involve a population-based approach.			... uses data from information systems to plan care.			... uses data from information systems to proactively plan population-based care, including the development of patient self-management programs and partnerships with community resources.			... uses systematic data and input from multidisciplinary clinical teams to proactively plan population-based care, including the development of patient self-management programs and community partnerships that include a built-in evaluation plan to determine success over time.		
Score	0	1	2	3	4	5	6	7	8	9	10	11

Components	Little support	Basic support	Good support	Full support
4-5: Routine follow-up for appointments, patient assessments and goal planning	... is not ensured.	... is sporadically done, usually for appointments only.	... is ensured by assigning responsibilities to specific staff (e.g., nurse case manager).	... is ensured by assigning responsibilities to specific staff (e.g., nurse case manager) who uses the registry and other prompts to coordinate with patients and the entire multidisciplinary clinical team.
Score	0 1 2 3 4 5	6 7 8	9 10 11	
4-6: Guidelines for chronic illness care	... are not shared with patients.	... are given to patients who express a specific interest in patient self-management of their condition.	... are provided for all patients to help them develop effective patient self-management or behavior modification programs, and identify when they should see a provider.	... are reviewed by the multidisciplinary clinical team with the patient to devise a patient self-management or behavior modification program consistent with the guidelines that takes into account patient's goals and readiness to change.
Score	0 1 2 3 4 5	6 7 8	9 10 11	

Scoring Summary

Category for ACIC-Prison	Total Score	Number of Questions	Average Score (Total Score/ Number of Questions)
Organization of health care system		7	
Other clinical linkages		4	
Patient self-management support		4	
Decision support		4	
Delivery system design		6	
Clinical information system		5	
Integration of chronic care model components		6	
		36	

Note. Adapted from MacColl Center for Health Care Innovation, Group Health Cooperative's ACIC, copyright 2000. Copyright 2012 by the Yale University.

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Figure 1.
Study protocol.

Table 1**Probes for Cognitive Interviews.**

Part I: Let's talk about the organization of the health care delivery system in the correctional health setting and how this may impact chronic illness care.

Question 1-1: What does the phrase "business plans" in Level C mean to you? How does it apply to the correctional health system?

Question 1-4: What thoughts came to mind when you read the phrase "regulations for chronic illness care"? What types of incentives exist for providers in correctional health?

Question 1-5: What were you thinking when reading Level D on Item 1-5?

Question 1-6: What thoughts came to mind when answering Item 1-6?

Part II: On linkages between the health care delivery system and community resources...

Question 2-1: What, in your opinion, are outside resources in the context of correctional health?

Question 2-2: What types of community organizations did you consider when answering this item?

Question 2-3: What does the phrase "regional health plans" mean to you? How does it apply to the correctional health system?

Part III: On characteristics of your state's correctional health or clinic practice...

Question 3-1-2: What types or forms of "self-management support" did you consider when answering Item 3-1-2?

Question 3-1-3: What thoughts came to mind when reading Item 3-1-3?

Question 3-4-1: How are patient registries kept within your correctional practice? What are some of the different registries in your correctional health system? How does the length of stay of an inmate affect their inclusion into the registries?

Question 4-3: What did you consider as "community programs" when answering Item 4-3?

Table 2

Survey Instrument Problem Classification and Item Modification.

ACIC Component	Issue Identified	Survey Item or Response (Question Number in Original ACIC)	Modification Made	Example of New Item (Question Number in Modified ACIC)
Organization of the health care delivery system	Comprehension	“Overall organization leadership” in chronic illness care ... does not exist or there is a little interest ... is part of the system’s long-term planning strategy, receive necessary resources, and specific people are held accountable. (1.1)	Changed item to reflect executive leaders’ priorities using an item from the patient-centered medical home survey	Executive leaders ... are focused on short-term business priorities ... support continuous learning throughout the organization and act upon quality data, have a long-term strategy and funding commitment to explore, implement, and spread chronic illness care. (1.1)
	Response	Incentives and regulations for chronic illness care ... are not used to influence clinical performance goals ... are used to motivate and empower providers to support patient care goals. (1.4)	Removed “incentives”	Regulations for chronic illness care ... are not used to influence clinical performance goals ... are used to motivate and empower providers to support patient care goals. (1.4)
	Comprehension	Senior leaders ... discourage enrollment of the chronically ill... visibly participate in improvement efforts in chronic care. (1.5)	Clarify “senior leaders” distinguishing executive leaders from clinical leaders	Clinical leaders ... discourage enrollment of the chronically ill... visibly participate in improvement efforts in chronic care. (1.5)
	Response	Role of the department of corrections on chronic illness care ... “because that’s a huge part of it, working along with DOC and making sure we’re all on the same page.”	New item	Custody ... intermittently focuses on chronic illness care ... has developed a vision for chronic illness care, but no consistent process for getting there. (1.6)
	Response/Comprehension	Benefits ... discourage patient self-management of system changes ... are specifically designed to promote better chronic illness care ... “Unclear about what benefits this was referring to (provider, patient, or system).” (1.6)	Replaced item with an item on hiring and training of personnel	The organization’s hiring and training processes (of health care providers and administrators) focus only on the narrowly defined functions and requirements of each position ... support and sustain improvements in chronic illness care though training focused on rewarding patient-centered care. (1.7)
Community (other clinical) linkages	Comprehension	Linking patients to outside resources ... is not	Changed to reflect use of outside resources during incarceration	Medical and surgical specialty services ... are

ACIC Component	Issue Identified	Survey Item or Response (Question Number in Original ACIC)	Modification Made	Example of New Item (Question Number in Modified ACIC)
		done systematically ... is limited to a list of identified community resources in an accessible format. (2.1)		difficult to obtain reliably ... are available from community specialists but are neither timely nor convenient. (2.1)
	Comprehension	Partnerships with community organizations ... do not exist.... are being considered but have not yet been implemented. (2.2)	Changed item to reflect access to behavioral health services during incarceration	Behavioral health services ... are difficult to obtain reliably ... are available from mental health specialists but are neither timely nor convenient. (2.2)
	Comprehension	Regional health plans ... do not coordinate chronic illness guidelines, measures, or care resources at the practice level ... would consider some degree of coordination of guidelines, measures, or care resources at the practice level but have not yet implemented changes. (2.3)	Changed item to reflect the role of the prison health system in enabling inmates' access to supportive community resources	Linking patients to supportive community-based resources ... is not done systematically ... is limited to providing patients a list of identified community resources in an accessible format ... is accomplished through a designated staff person or resource responsible for connecting patients with community resources. (2.3)
	Response	Role of discharge planning in continuing care ... "How does discharge planning ease follow-up of care after release?"	New item	Linking patients to medical resources after discharge from prison ... is not done systematically ... is limited to providing patients a list of identified resources in an accessible format. (2.4)
Self-management support	Response	Addressing concerns of patients and families (3.1.3)	Removed "families"	Addressing concerns of patients (3.1.3)
	Comprehension	Effective behavior change interventions (3.1.4)	Added "peer support" to reflect the role of the prison community	Effective behavior change interventions and peer support (3.1.4)
Decision support	Response	Informing patients about guidelines ... is not done ... happens on request or through system publications. (3.2.4)	Changed "through system publication" to "verbally"	Informing patients about guidelines ... is not done ... happens on request or verbally. (3.2.4)

ACIC Component	Issue Identified	Survey Item or Response (Question Number in Original ACIC)	Modification Made	Example of New Item (Question Number in Modified ACIC)
Delivery system design	Comprehension	Practice team functioning ... is not addressed ... is addressed by assuring the availability of individuals with appropriate training in key elements of chronic illness care. (3.3.1)	“Practice” changed to “multi-disciplinary clinical”	Multidisciplinary clinical team functioning ... is not addressed ... is addressed by assuring the availability of individuals with appropriate training in key elements of chronic illness care. (3.3.1)