



AMERICAN UNIVERSITY OF BEIRUT

THE FEASIBILITY OF IMPELEMNTING THE CHRONIC CARE  
MODEL IN THE MANAGEMENT OF DIABETES AT A PUBLIC  
HEALTH CENTER IN LEBANON

by

BASSAM MARWAN ITANI

A project  
submitted in partial fulfillment of the requirements  
for the degree of Master of Science in Nursing  
to the Hariri School of Nursing (Administration Track)  
of the Faculty of Medicine  
at the American University of Beirut

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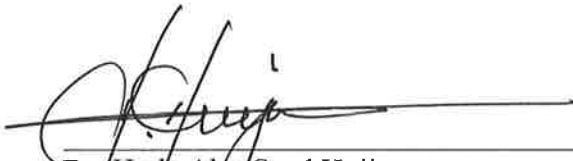
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## AN ABSTRACT OF THE PROJECT OF

Bassam Marwan Itani for Master of Science in Nursing  
Major: Nursing Administration

Title: The Feasibility of Implementing the Chronic Care Model in the Management of Diabetes at a Public Health Center in Lebanon

**Purpose:** In a Lebanese primary healthcare center, a gap analysis was conducted to assess the feasibility of implementing the Chronic Care Model in the management of diabetes.

**Method:** The Assessment of Chronic Illness Care (ACIC tool version 3.5) was used to assess the implementation of the Chronic Care Model elements in the healthcare center. One multi-disciplinary team consisting of two nurses, one physician, one social worker and the nursing director (as the team leader) were asked to complete the ACIC tool. Every member was asked to score the criteria for one element within a one week time frame. A “respond and think aloud” method was used to elaborate on the results among the multi-disciplinary team members.

**Result:** Average component score of diabetes management at the center was 6.18 reflecting good support for diabetes care. The delivery system designed scored the highest (average score= 8.8), followed by the decision support (average score= 7.2), then by self-management (average score=6.5), clinical information system (average score=5.6), the organization of healthcare system (average score=5.5), integration element (average score=5.1) and community linkage (average score=4.6). The healthcare center has some gaps related to every element in the chronic care model. A quality improvement plan was designed with goals and objectives to fill the gaps. For example, evidence based integration in practice, utilization of comprehensive quality

improvement plans, offering incentives for nurses to get certifications, contracts with other community resources, and utilization of clinical information registries can be implemented to improve the management of diabetes care at the center.

**Conclusion:** Implementing the Chronic Care Model for the management of diabetes is feasible in order to enhance better patient outcomes, and assist in management and prevention of diabetes and other chronic diseases.

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# CHAPTER I

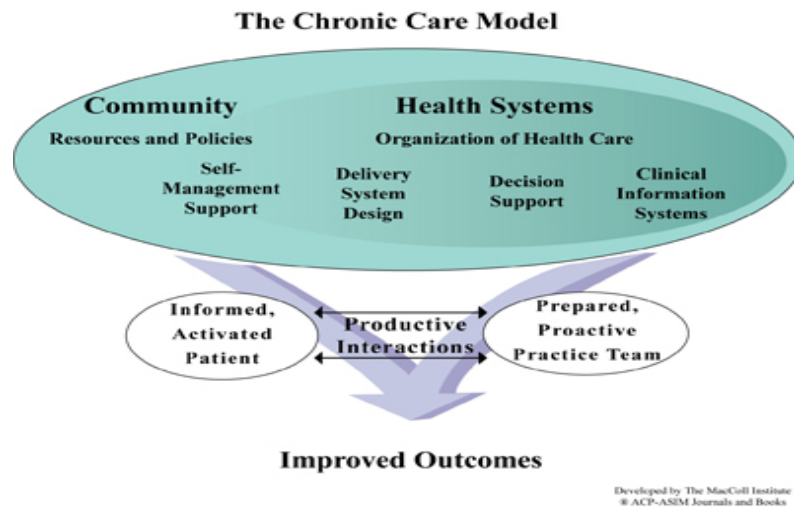
## INTRODUCTION

### 1.1 Diabetes Prevalence

Diabetes, a non-communicable chronic disease, is one of the most prevalent chronic diseases. Research has shown that diabetes prevalence is rising especially in the Middle East and North Africa region (Whiting, Guariguata, Weil, & Shaw, 2011), and Lebanon was ranked the 7<sup>th</sup> with 19.6% in diabetes prevalence in 2011. It is estimated that Lebanon will be ranked the 3<sup>rd</sup> in 2030 with 23.4% prevalence (Whiting et al., 2011). According to the International Diabetes Federation (2013), the number of undiagnosed diabetes cases in Lebanon is 239,480, while the number of diagnosed cases is 478,960. This growth in prevalence is associated with a rise in healthcare cost especially when complications are noted such as nephropathy, heart disease, retinopathy and foot ulcers (Morsanutto, Berto, Lopatriello, Gelisio, Voinovich, Cippo, and Mantovani, 2005). Moreover, a study conducted on 2,195 Lebanese for diabetes management in Lebanon found that 82% of participants didn't assess their blood glucose levels daily, 64.2% did not conduct foot exam during the past year, and 52.4% did not conduct the yearly recommended eye exam (Costanian, Bennett, Hwalla, Assaas, and Sibai, 2014). The article also found that the most common complications of diabetes are heart disease (27.8%) and retinopathy (16.6%). In addition to the health problems that diabetes causes, occupational and work problems are related to diabetes. According to Tunceli et al., diabetes is associated with a decrease in productivity and work limitations. The authors examined the relationship between diabetes and work-loss days; they found out that women with diabetes have 2 more work-loss days per year than women without diabetes. (Tunceli et al., 2005).

## **1.2 The Chronic Care Model (CCM)**

Despite advances in the effectiveness of treatment, research shows that patients frequently do not attain the care they expect. Wagner, Austin, Davis, Hindmarsh, Schaefer, and Bonomi (2001) identified a quality gap in healthcare delivery due to three main reasons: the increased demands on medical care, the increased prevalence of chronic illnesses, and the poorly equipped healthcare services. The article also sites that the best solution for these problems is to change and improve the healthcare systems by implementing the chronic care model (Wagner et al., 2001). The chronic care model was first designed by The MacColl Institute for Healthcare Innovation in the early 1990's, and then it was reviewed and published in its current form in 1998 ("Improving Chronic Illness Care", 2014). Thus, the Chronic Care Model (CCM) is designed to improve healthcare practices to meet patients' outcomes. The Chronic Care Model aims at changing the routine delivery of ambulatory care through six elements meant to make patient-centered and evidence-based care easier to accomplish (Stuckey, Dellasega, Graber, Mauger, Lendel, and Gabbay, 2009). The six elements focus on health system, self-management, decision support, delivery system design, clinical information systems and community resources (Wagner et al., 2001). The chronic care model also embraces the involvement of the patient, healthcare provider and the healthcare organization for health care enhancement.



*Figure 1.*The chronic care model, The MacColl Institute.

The six elements of the chronic care model are defined as follows (“Improving Chronic Illness Care”, 2014):

1. The health system element seeks at improving the chronic illness care in the healthcare organization through the collaborative work of healthcare leaders and the involvement of senior leadership. The enhancement in the healthcare organizations aims to promote safe and high quality care. For instance, healthcare leaders should develop policies and encourage staff to adhere to policies as means to better health care and quality (Barr, Robinson, Link, Underhill, Dotts, Ravensdale, & Salivaras, 2003). Moreover, healthcare organizations should benefit from their mistakes in order to implement appropriate changes to their systems.
2. The delivery system design targets the delivery of competent and effective patient care. This can be achieved through transforming the healthcare system from reactive to proactive. One of the ways to create a proactive system is to define roles and tasks among healthcare team members, support evidence based care, assist patients in having regular follow

up with their healthcare providers, and provide them with the medical knowledge that best fits their background and understandings.

3. The decision support aims at providing chronic illness care based on evidence and patient preference. Decision support can be achieved through involving patients in their health care plan, using the appropriate education methods and specialist expertise. Moreover, evidence based practices should be imbedded in the daily practices.

4. The self- management support element focuses on patient empowerment. One of the ways to empower patients to inform them about their health care plan and engage them in it. For instance, healthcare providers and patients are requested to set goals, prioritize and design treatment plans.

5. The community linkage element of the CCM encourages patients to participate in community programs. Moreover, policies should be designed to deliver better community care for patients, and patients should work with community resources to pinpoint some gaps in health care delivery if found.

## CHAPTER II

### LITERATURE REVIEW

A literature review was done to identify the relationship between implementing CCM and Diabetic patient outcomes. For this project, nine studies were retrieved including two RCTs, two systematic reviews, three quality improvement plans, a literature review and a cross-sectional study. Evidence shows that implementing the CCM in the community is effective in improving clinical and behavioral outcomes in patients with diabetes.

#### **2.1. Chronic Care Model and Patient Outcomes**

A literature review was conducted by Coleman, Austin, Brach, and Wagner (2009) to identify the impacts of implementing the CCM on clinical care and health outcomes. The findings revealed that HbA1c levels were lower among patients whose plan of care is adapted from the chronic care model, and the risk of having heart disease was lower. In addition, utilizing the elements of the chronic care model was associated with higher patient satisfaction and better quality outcomes.

A systematic review by Stellefson, Dipnarine, and Stopka (2013) looking at the effectiveness of adopting the chronic care model in primary care settings in the US, noted different positive outcomes. Some of the reported outcomes included more adherences to the ADA guidelines by the healthcare providers, improved HDL cholesterol levels and HbA1c levels, and improved patient empowerment about diabetes. Similarly, another study revealed that self-monitoring of blood glucose level over a 12 months period increased, and HbA1c levels had decreased from 7.6% to 7% (Stellefson et al., 2013).



On the other hand, a randomized control trial by Piatt et al. (2006) compared the effect of applying the CCM in practice whereby the researchers divided the study participants into three groups. The first group (n=30 patients) had the chronic care model introduced into the practice, in the second group (n=38 patients) only educating the healthcare providers was introduced, and no changes in practice were introduced to the third group (n=51). The results revealed an improvement in the HbA1c levels among the first group, and the improvement was noted over a three-year follow up period. As for the other groups, the HbA1c levels were baseline. Moreover, the blood pressure improved in all groups, but the only difference in the CCM group was the improvement in the diastolic blood pressure. Behavioral outcomes like patient empowerment were noted in the chronic care model group. (Piatt et al., 2006)

Moreover, another study by Coca and Francis (2007) showed how patients' empowerment was noted to have positive outcomes on diabetes management. Patients in the study were noted to adhere to their medications, foot and eye examination schedules, participate in setting goals and health care plan (Coca & Francis, 2007).

In addition, Lyles et al. (2011) led a study on patient satisfaction and the CCM; the study revealed that patients became more knowledgeable about their health. For instance, diabetic patients shared their blood glucose levels with their healthcare providers. Some patients used technology for sharing their results, while others had some trouble in dealing with technology. (Lyles et al., 2011).

Nutting et al. (2007) conducted a study that examined the effectiveness of implementing the CCM elements on clinical and behavioral outcomes. The study included 90 healthcare professionals (60 physicians, 17 nurse practitioners and 13 physician's assistants) and 886 diabetic patients. The healthcare providers were asked to complete a questionnaire related to

implementing the CCM elements in their practice. The answers were rated according to a five-point scale (never, rarely, occasionally, usually and always). Clinical and behavioral composite scores were computed in the study. The clinical composite score includes assessment of patients' blood pressure, lipids profile, HbA1c levels, foot and retinal examination and micro albumin profile. The behavioral composite score includes patient education, self- management and nutrition profile. The results of the study revealed that implementing the CCM elements in practice is linked to lower HbA1c levels ( $p=0.002$ ) and lipid ratio ( $p=0.02$ ). In addition, a higher behavioral composite score was noted when implementing the CCM ( $p=0.001$ ). In other words, implementing the CCM resulted in better clinical and behavioral outcomes. (Nutting et al., 2007).

In addition, the CCM is an effective model for implementing diabetes self-management training (DSMT). Siminerio et al. (2006) led a quality improvement plan, where 382 diabetic patients were eligible to participate in. The aim of the project was to evaluate whether the CCM will sustain the diabetes self-management training program (DSMT) at the University of Pittsburg Medical Center. This is evaluated through following up on the reimbursement, HbA1c levels and the number of patients receiving DSMT in a primary care center. The findings revealed that reimbursement to cover costs have increased, and the HbA1c levels improved when CCM was implemented ( $p=0.0001$ ). In addition, a greater percentage of patients is noted receiving DSMT in primary care centers (26.4% suburban, 19.8% urban) than in hospital setting (8.3%).

Table 1: *Literature Review*

Author/date/title	Type of study	Results
Piatt et al. 2006 Translating the Chronic Care Model Into the Community	Randomized Control Trial	Improvement in HbA1c level, and better patient empowerment.
Nutting et al. 2007 Use of Chronic Care Model Elements Is Associated With Higher-Quality Care for Diabetes (2007)	Quality Improvement Plan	Lower cholesterol levels and HbA1c.
Siminerio et al. 2006 Deploying the chronic care model to implement and sustain diabetes self-management training programs.	Quality Improvement Plan	Increased coverage of healthcare costs through reimbursement . Increased diabetes self-management training (DSMT).
Coleman et al. (2009) Evidence on the chronic care model in the new millennium.	Literature Review	Decreased HbA1c levels and decreased risk of having heart disease. Higher patient satisfaction and better quality outcomes.
Stellefson, Dipnarine, and Stopka (2013) The chronic care model and diabetes management in US primary care settings: A systematic review	Systematic Review	Better adherences to the ADA guidelines by the healthcare providers. Improved HDL cholesterol levels and HbA1c levels. Improved patient empowerment.
Coca and Francis (2007) Implementing the chronic care model in an academic setting: A resident's perspective.	Quality Improvement Plan	Increased of patients' adhere to their medications, foot and eye examination. Participation in setting goals and health care plan
Dancer et al.	Systematic Review	Improving outcomes for

(2010) Improving diabetes patient outcomes: Framing research into the chronic care model.		patients, disease management should shift from an incomplete and scattered focus to a comprehensive model such as the CCM.
MacLean et al. (2004) The Vermont Diabetes Information System (VDIS): Study design and subject recruitment for a cluster randomized trial of a decision support system in a regional sample of primary care practices.	Cluster Randomized Trial	Applying the CCM in primary healthcare centers is feasible through low-cost decision support and information system.
Liebman et al. (2007) Establishing diabetes self-management in a community health center serving low-income Latinos.	Cross-sectional	Decrease in HbA1c level. Approximately half of the center's patients reached the target goal of HbA1c (7).

## 2.2. Purpose of the Project

The purpose of this project is to perform a gap analysis and to assess the feasibility of implementing the Chronic Care Model in the management of Diabetes at a Public Health Center (PHC) in Lebanon. The primary objectives of the student's involvement in this project was to introduce the essential elements of the chronic care model, facilitate the scoring process of the tool's criteria by the health care team members, and help in identifying priorities where changes are needed. The findings will help the team at the PHC highlight the strengths of the system design and practices that matches the requirements of the Chronic Care Model, as well as the system changes needed to fill all the requirements of the Chronic care Model elements.

## CHAPTER III

### METHODOLOGY

#### **3.1. Setting Description**

The healthcare center is located in Beirut, and is one branch of 23 centers distributed all over Lebanon. It was established in the beginning of the year 2000 as a humanitarian and medically oriented non-profit organization to fulfill the health needs of the Lebanese population. The healthcare center aims at providing affordable and high quality health services to the inhabitants of Lebanon irrespective of their nationality or race. The total number of diabetic patients screened at the healthcare center is 3984 patients (till January 23, 2015).

The center provides various curative services including family medicine, dentistry, and psychiatry; preventive services such as vaccines and diagnostic tests (pap smear, mammography and breast ultrasound). Moreover, the center aims to educate patients, for instance, teaching sessions are conducted based on community needs. In addition, the center provides its staff with the necessary medical education to ensure high healthcare quality. Finally, the center has social services whereby social workers deal with the patients and their families. Social programs conducted by the center include awareness campaigns, activities for the elderly and needs assessment.

#### **3.2. The Assessment of Chronic Illness Care Tool**

Assessment of the Chronic Care Model is done via two tools, the Assessment of Chronic Illness Care (ACIC) tool and the Patient Assessment of Chronic Illness Care (PACIC). A validated assessment tool “the Assessment of Chronic Illness Care (ACIC) tool version 3.5”

was used. This tool was developed by the MacColl Institute for Healthcare Innovation (2000) to help mapping the healthcare system supporting the chronic illness care. The ACIC tool is a diagnostic survey completed by healthcare professionals. It specifies the current practices of chronic care, identifies the areas for improvement to comply with all the components of the CCM and evaluates the level of improvement. (“Improving Chronic Illness Care”, 2014). On the other hand, the PACIC tool assesses the chronic illness care from the perspective of patients. It compares the care delivered to patients to that with the Chronic Care Model, for instance, problem solving, proactivity, etc... (“Improving Chronic Illness Care”, 2014)

For this project, the ACIC tool is used since it is less time consuming than the PACIC tool. For instance, the IRB approval is not required for utilizing the ACIC tool while it is needed for the PACIC tool. The ACIC tool was designed by Bonomi, Wagner, Glasgow, and Von Korff in 2002 (Bonomi et al., 2002) to improve health care quality. The tool includes subscale scores for each element in the Chronic Care Model. There are two versions of the tool: version 3.0 and version 3.5. Version 3.0 includes the six elements of the CCM: healthcare organization, community linkages, self-management support, decision support, delivery system design and clinical information systems. The current version used of the ACIC tool is 3.5, which includes the same elements of the version 3.0 in addition to an item that evaluates how well a healthcare organization integrates the CCM elements (“Improving Chronic Illness Care, 2014”)

The ACIC tool is composed of seven elements. Every element includes multiple criteria that can be scored from zero (the lowest) to 11 (the highest) and are divided into four levels of performance A, B, C and D. The scores ranging between 0-2 are included in level D reflecting a limited support to chronic illness; those ranging between 3-5 are included in level C reflecting

basic support; the scores ranging between 6-8 belong to level B reflecting good support, while those ranging between 9-11 belong to level A reflecting excellent support of chronic illness.

Table 2: *ACIC Scoring Methodology*

Scores	Levels	What Does it mean?
0-2	D	Limited support for chronic illness care
3-5	C	Basic support for chronic illness care
6-8	B	Reasonably good support for chronic illness care
9-11	A	Fully developed chronic illness care

### 3.3. Project Steps and Communication Plan

In December 2, 2014, the General Manager of the PHC approved the activity as a quality improvement project and assigned the Nursing Director to coordinate the process. In December 3, 2014, a proposal of two-pages was sent to the IRB to validate that the project is a quality improvement project, not a research study. In the same date, an appointment was set with the nursing director of the primary healthcare. Then, in December 4, 2014, a meeting was held with the Nursing Director (ND) during which the project's aim and methodology were explained. The project's steps were discussed and agreed on and the ND promised to gather for this project a multidisciplinary self-assessment team including two nurses, one physician, one social worker, and the ND herself as the team leader.

The first meeting with the multidisciplinary team took place in December 11, 2014, during which the purpose of the project, the chronic care model and its six essential elements were introduced to the team members. Every member was asked to score the criteria for one

element within one week frame by identifying how much every criterion is being implemented at their center using a scale ranging from 0 (not at all) to 11 (fully). Then, a second meeting in December 18, 2014, was held during which the team members were asked to participate in a “respond and think aloud” strategy (Nutting et al., 2007) to elaborate their perceived meaning of each item in the ACIC tool and how they scored it. The scores were done and explained individually by each team member and then discussed and a consensus reached. On December 24, 2014, a third meeting was conducted as continuity for the previous meeting to emphasize the scoring of the ACIC tool, and the members agreed on the weight given to every criterion. A consensus was reached to decide the final scoring for the ACIC tool. As for the student, he was not involved in the assessment process itself; his role is only to facilitate the scoring process. After that, the ND sent the filled ACIC to the student who developed a table describing the highly scored elements in the current system design that align with the chronic care model (CCM) requirements, as well as the low scored elements in the system performance as compared to the CCM requirements.

On February 3, 2015, a fourth meeting was held to perform a gap analysis between current performance and optimal performance as described in the tool. Elements that scored poorly (5 or less) were analyzed to discuss nonconformities, what additional resources, skills and training may be needed to bring the current diabetes care at the center up to the CCM standard’s elements. Accordingly, a quality improvement plan with goals and objectives was set by the multidisciplinary team. In February 10, 2015, a fifth meeting was done as continuity for the previous meeting and the multidisciplinary team finalized the quality improvement plan.



Table 3: *Methodology*

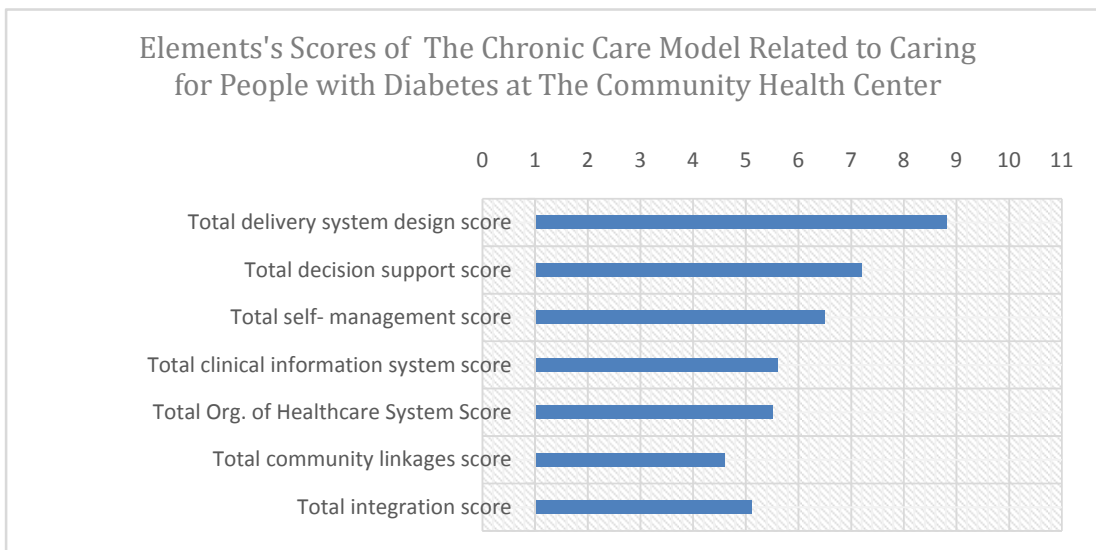
<b>Dates</b>	<b>Steps</b>	<b>Communication method</b>	<b>Responsible person</b>
Dec 2, 2014	Get the approval of the Director of PHC to implement the project	F2F	Student
Dec 3, 2014	Send a two-page proposal to IRB to validate that this is a QIP & not a research study	Email	Faculty
Dec 3, 2014	Set an appointment with the Nursing Director (ND) of the PHC	Phone Call	Faculty
Dec 4, 2014	<ol style="list-style-type: none"> <li>1. Explain the project's aim, and methodology to the ND</li> <li>2. Discuss the possibility of establishing a multidisciplinary self-assessment team including nurses, one physician, one dietitian, a social worker, and any other interested healthcare provider working at the center, plus to the investigators (MSN student and Faculty)</li> <li>3. Agree on methodology and meeting dates</li> </ol>	F2F	Faculty + Student  Faculty + Student +ND    Faculty + Student +ND
Dec 11, 2014 At 12:30pm	<ol style="list-style-type: none"> <li>1. Introduce the purpose of the project, the methodology, and the ACIC tool to team members.</li> <li>2. Divide the team members into three groups. Each group will be asked to rate the items of two essential elements of the ACIC tool within one week time-frame</li> </ol>	Team Meeting	Student supported by Faculty
Dec 18, Dec 24 2014	Share feedback and elaborate on perceived meaning of each item in the ACIC tool and how they scored it, in order to reach a consensus on all elements scorings	Team Meeting	Team members including student and faculty
Feb 3, 2015 Feb 10	Discuss identified nonconformities, needed changes, and challenges in the internal and external environment that might hinder implementing the proposed changes	Team Meeting	Team members including student and faculty
March 2015	<ol style="list-style-type: none"> <li>1. Prepare the final report and send it to team members for approval</li> <li>2. Present the finding to the PHC administration</li> <li>3. Send the final report to the PHC administration</li> </ol>	Email  F2F presentation  Email	Student supported by Faculty  Student  Student

## CHAPTER IV

### FINDINGS

#### 4.1 ACIC Scores

The average component score of Diabetes management at the primary healthcare center was found to be 6.18, which belongs to level B and reflects a good support for Diabetes care at the Health Care Center. The delivery system design element got the highest score with a total of 8.8, followed by the decision support element with a total score of 7.2, and then the self-management element received a total of 6.5. The clinical information system element ranked fourth with a total of 5.6, followed by the organization of healthcare system element with a total score of 5.5, then the integration element scored a total of 5.1 and finally the community linkages element scored 4.6 in total.



*Figure 2.* Bar graph showing the element's scores of the chronic care model related to caring for people with diabetes at the community health center.

#### **4.1.1. Organization of Healthcare Delivery System**

The organization of the healthcare delivery system is composed of six scoring items. The first item relates to organizational leadership in chronic illness care and received a score of 5/11 (level C). The organizational leadership is reflected in the vision statement of the primary healthcare center through providing primary care services at affordable prices and a commitment to quality service and e-health, yet, no specific resources are allocated for diabetes care. The second scoring item relates to organizational goals and received a score of 5/11 (level C). The positive points were the presence of organizational goals that were newly updated; however, they lack measurable indicators. The third item is the improvement strategy for chronic illness care, and it received also a score of 5/11. The center utilizes adhoc approaches for targeted problems, whereby the staff and leadership meet and discuss the areas that need improvement; yet, comprehensive quality improvement plans are not available. The fourth item is the incentives and regulations for chronic illness care. It received a score of 2/11 (level D) since the only incentive they offer to staff is sending them occasionally to attend workshops. As for the senior leadership item, it received a score of 9/11 (level A). Improvement efforts are encouraged in chronic care, and the center has been working on getting accredited by a Canadian body in collaboration with the Lebanese Ministry of Health. As for the final item related to benefits, it received a score of 7/11 whereby some resources used to be dedicated to Diabetic patients, such as discounts on lab tests and referrals but were suspended for the time being.

Table 4.1: *Scoring of the Organization of Healthcare Delivery System*

<b>Organization of Healthcare Delivery System</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
- Overall organizational leadership in chronic illness care		5		
- Organizational goals for chronic care		5		
- Improvement strategy for chronic illness care		5		
- Incentives and regulations for chronic illness care	2			
- Senior Leaders				9
- Benefits			7	

#### 4.1.2. Community linkages

The scoring of this element is based on three items. The first item in this element is linking patients to outside resources scoring 7/11 (level B). The center marks the presence of social workers and diabetic nurses for coordinating and referring patients to community resources such as chronic care center, Med net insurance, IMC (International Medical Corporation), Ministry of Health, etc... However, no regular meetings between the health system, community service agencies and patients were noted. The second item is partnerships with community organizations that received 6/11 (level B). Contracts were done with MOH and YMCA to provide the center with medications for the diabetic patients. Moreover, a contract with IMC was done to provide health coverage for Syrian and Iraqi refugees. Yet, the center lacks formal supportive programs and related policies across their entire system. As for the final item, the regional health plans received a score of 1/11 (level D) because even though the center

follows the MOH general guidelines for chronic illness care; yet, coordinated guidelines between the center and other community or regional health organizations were missing.

Table 4.2: *Scoring of Community Linkage*

<b>Community Linkage</b>	<b>Little Support 0-2</b>	<b>Basic Support 3-5</b>	<b>Good Support 6-8</b>	<b>Excellent Support 9-11</b>
Linking Patients to Outside Resources			7	
Partnerships with Community Organizations			6	
Regional Health Plans	1			

#### **4.1.3. Practice level**

This element is divided into four parts: self-management support, decision support, delivery system design and clinical information system.

##### **4.1.3a: Self-management support.**

It is composed of four elements. The first item is the assessment and documentation of self-management needs and activities and received a score of 10/11 (level A). The assessment of the self-management needs are done for every patient by the diabetic nurse and documented on the electronic patients file. The second item is self-management, and it received a score of 5/11 (level C). Clinical educators have an active role whereby they distribute pamphlets and provide regular individualized and group training sessions. However, the clinical educators lack formal training in patient empowerment and problem-solving methodologies. The third item is addressing concerns of patients and families; it received a score of 5/11 (level C) since it is not an integral part of care and does not include systematic assessment and routine involvement in

peer support, groups, or mentoring programs. Patients’ concerns are addressed through referrals only. The last item is effective behavior change interventions and peer support with score of 6/11(level B). The peer support, group therapy or mentoring programs are not readily available and an integral part of routine care; the center refers patients for specialized centers to achieve behavior changes and peer support.

Table 4.3: *Scoring of Self-Management Support*

<b>Self-Management Support</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
Assessment and Documentation of Self-Management Needs and Activities				10
Self-Management Support		5		
Addressing concerns of patients and families		5		
Effective Behavior Change Interventions and Peer Support			6	

#### 4.1.3b. Decision Support

This element is composed of four items. The first item is the evidence based guidelines scoring 8/11(level B). The center supports the utilization of evidence based guidelines through provider education. Yet, it needs to be integrated into care through reminders or other proven provider behavior change methods. The second item is the involvement of specialists in improving primary care. It received a score of 9/11(level A). Specialists in improving primary care (mainly specialized physicians) are available at the center. The third item is provider education for chronic illness care, and it received 6/11(level B). The nurses at the center were sent to attend a community care course at the American University of Beirut. Nevertheless, there

are no regular trainings for all the practice team in chronic illness care methods, such as population-based management, and self-management support. The final item is informing patients about guidelines, and it received 6/11(level B). The center provides patients with education materials for some guidelines, yet, not all guidelines include specific materials that describe the role of patients in guideline adherence.

Table 4.5: *Scoring of Decision Support*

<b>Decision Support</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
Evidence-Based Guidelines			8	
Involvement of Specialists in Improving Primary Care				9
Provider Education for Chronic Illness Care			6	
Informing Patients about Guidelines			6	

#### 4.1.3c: Delivery system design

This element is composed of six items. The first item is related to practice team functioning, and it received a score of 7/11(level B). The center provides regular team meetings to address staff problems and staff training needs; yet, the team meetings do not address guidelines, roles and accountability, and problems in chronic illness care. The second item which is practice team leadership received 8/11(level B). The leadership in the healthcare system is assured by the appointment of In-charge/team leader for diabetic clinics with defined roles and responsibilities. The third item is appointment system, and received a score of 10/11 (level A). The center utilizes the appointment system to schedule acute care visits and follow-up with

chronically ill patients. Moreover, it is organized by nurses who facilitate the patient seeing multiple providers in a single visit. The fourth item is follow-up with a score of 10/11 (level A). The center customizes it according to patient needs and assures guideline follow-up, and it varies in intensity and methodology (phone, in person, email). The fifth item is planned visits for chronic illness care with a score of 9/11 (level A). The planned visits are used for all patients and include regular assessment (every 3 months), preventive interventions and attention to self-management support. The final item is the continuity of care that scores 9/11 (level A). The center provides active coordination between primary care specialists and other relevant groups for disease intervention strategies.

Table 4.6: *Scoring of Delivery System Design*

<b>Delivery System Design</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
Practice team functioning			7	
Practice team leadership			8	
Appointment System				10
Follow-up				10
Planned Visits for Chronic Illness Care				9
Continuity of Care				9

#### 4.1.3d. Clinical Information Systems

This element is composed of five items. The first item is registry and received a score of 4/11 (level C). The center has an automated registry including list of patients with diagnosis, contact information, and date of last visit. However, it doesn't sort subpopulations by clinical priority, and it is not tied to guidelines which provide prompts and reminders about needed



services. The second item is the reminders to providers that received a score of 4/11 (level C). The system at the healthcare center provides general notification of the existence of a chronic illness (diagnosis), yet, it doesn't describe needed services at time of encounter, or through periodic reporting. The third item is feedback in relation to team performance specific to team's population that received a score of 9/11 (level A). The center conducts performance appraisals on yearly basis. They include individualized training goals. Nevertheless, it doesn't incorporate documented performance goals. The fourth item is information about relevant subgroups of patients needing service received a score of 7/11 (level C). The information in the center can only be obtained with special efforts or additional programming, yet, it is not provided routinely to providers to help them deliver planned care. The final item is patient treatment plans and received a score of 4/11 (level C). This is achieved through a standardized approach to patient treatment plans; yet those plans are not established collaboratively and do not include self-management as well as clinical management plans.

Table 4.7: *Scoring of Clinical Information Systems*

<b>Clinical Information Systems</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
Registry		4		
Reminders to providers		4		
Feedback in relation to team performance specific to the team's population				9
Information about Relevant Subgroups of Patients Needing Services			7	
Patient Treatment Plans		4		

#### ***4.1.4 Integration of Chronic Care Model Components***

The first item in this element is informing patients about guidelines, and it received a score of 6/11 (good support). The primary healthcare center performs patient education about guidelines through specific education material, but not all guidelines include specific materials designed for patients and their role in guideline adherence. The second item is information systems/registries and received a score of 3/11 (basic support). The registries at the center include results of patient assessments and treatment plan. Nevertheless, it doesn't include patient self-management goals that are developed using input from practice team and patient. The third item is community programs, and it received a score of 8/11 (good support). The center organizes regular meetings between its social workers and community representatives to discuss population needs. The fourth item is organizational planning for chronic illness care and received a score of 4/11 (basic support). The center uses data from information systems to plan care; yet, the utilization is not proactive to plan population based-care such as self-management programs and partnerships with community resources. The fifth item is routine follow-up for appointments, patient assessments and goal planning and received a score of 5/11 (basic support). This routine follow-up is sporadically done in the center for appointments. However, it is not ensured by assigning responsibilities to specific staff that use the registry to coordinate patient care. The final item included in this element is guidelines for chronic illness care that received a score of 5/11 (basic support). The center provides such guidelines for patients who express a specific interest in self-management of their condition. Nevertheless, those guidelines are not reviewed by the practice team with the patients so that a self-management or behavior program is designed.

Table 4.8: *Scoring of Integration of Chronic Care Model Components*

<b>Integration of Chronic Care Model Components</b>	Little Support 0-2	Basic Support 3-5	Good Support 6-8	Excellent Support 9-11
Informing Patients about Guidelines			6	
Information Systems/Registries		3		
Community Programs			8	
Organizational Planning for Chronic Illness Care		4		
Routine follow-up for appointments, patient assessments and goal planning		5		
Guidelines for chronic illness care		5		

## CHAPTER V

### THE QUALITY IMPROVEMENT PLAN

After reviewing the items scores, the team members agreed that items scoring 5 or less need to be targeted for improvement. Three key questions were addressed by the team: (1) what are we trying to accomplish? (2) How are we going to measure the improvement? And (3) what are the changes that need to be made? Accordingly, four major goals with eight specific objectives were developed.

#### **5.1. The First Goal: Improving the Care Delivery System of Diabetic Patients**

This goal can be achieved by first updating the strategic plan of the center to include a specific goal related to improving Diabetes care. The ND can collaborate with the endocrinologist and the Diabetes charge nurse to identify the type of intrinsic and extrinsic motivators that will encourage staff to support patient care goals. An example would be sending diabetes nurses to get certification as diabetic patient educators. Moreover, a yearly bonus could be awarded to diabetic nurses whose performance appraisals exceed standards. The nursing director is the person responsible to propose this objective, and the general manager is the person to approve it. The indicators for achieving this objective are the types and number of incentives added to health care provider salary.

Table 5.1: *Improving the Care Delivery System of Diabetic Patients*

<b>Objective</b>	<b>Indicator</b>	<b>Task</b>	<b>Responsible person</b>	<b>Timeline</b>
Review and update the strategic plan of the center to include organizational goals specific to the management of diabetic patients.	Number of goals specific to diabetic clinic in new strategic plan	The Nursing director in collaboration with endocrinologist will propose specific goals to improve diabetic care based on validated assessment tool for management of chronic disease.	<ul style="list-style-type: none"> <li>– Nursing director</li> <li>– Endocrinologist</li> <li>– In charge nurse</li> </ul>	2015
The administration visibly supports improvement at all levels of the organization and provides intrinsic (knowledge of nurse by attending sessions) and extrinsic (incentives like “thank you” letter) motivators to encourage staff to support patient care goals.	Types and number of incentives added to health care provider salary	Send diabetes nurse to attend diabetes workshop at least once/year. -To become certified as diabetic patient educator. -Give yearly bonus for diabetic nurse whose performance appraisal exceeds standard.	<ul style="list-style-type: none"> <li>– Nursing director sends proposal to general manager for approval.</li> </ul>	2015

## **5.2. The Second Goal: Empowering and Preparing Diabetic Patients to Manage their Healthcare**

The second goal proposed is to empower and prepare diabetic patients to manage their healthcare. One of the objectives to complete this goal is to use effective self-management support strategies, for instance, those that include assessment, goal-setting, action planning, problem solving and follow-up. The nursing department should develop pre-printed care plan in Arabic language (native language) with individualized instructions needed for each patient. Moreover, a soft copy should be saved in each patient’s file to be printed and given to the patient when needed. The second objective in preparing patients to manage their healthcare is to

reactivate the allocation of resources that facilitate patients' compliance with diabetes management. The diabetic clinic team should review the list of free services that can be offered to diabetic patients per year after getting the approval of the administration.

Table 5.2: *Empowering and Preparing Diabetic Patients to Manage their Healthcare*

<b>Objective</b>	<b>Indicator</b>	<b>Task</b>	<b>Responsible person</b>	<b>Timeline</b>
Use effective self-management support strategies that include assessment, goal-setting, action planning, problem-solving and follow-up	-number of patients who have self-management care plans divided by number of diabetic patients seen	-Develop preprinted care plan in Arabic language with individualized instructions needed for each patient. -A soft copy saved in the patient's file; a printed hard copy is given for the patient.	Nursing department	2015
Reactivate the allocation of resources dedicated to facilitate patients' compliance with diabetes management	-number of services that are free of charge for diabetic patient	-Review list of services given for diabetic patient /year after getting the approval of the administration	Team of Diabetes clinic	2015

### **5.3. The Third Goal: Enhancing the Electronic Registry of Patients**

The third goal that the administration will consider is enhancing the electronic registry to provide the information necessary for monitoring patient's health status and reducing complications. The first objective in achieving this goal is to update the current software as to deliver timely reminders for providers and patients about needed services at time of encounter, or through periodic reporting. The diabetic clinic team (nurses and doctors) should decide the priority type of alerts needed for each patient. For instance, HbA1c greater than 9 for diabetic patients, LDL greater than 130 and blood pressure greater than 140/90 can be alerts. Moreover,

the nursing director can request the IT department to install reminder mark for each file concerning the follow up exams or procedures, such as eye exam, lipid screening, nephrology, cardiology and vascular referral. The second objective is to enable the system to identify and retrieve the list of patients with more than one chronic disease. Both objectives are achievable at this time period because the center is currently updating all IT programs and software so the ND needs only to justify the requests and inform about specific changes needed.

Table 5.3: *Enhancing the Electronic Registry of Patients*

<b>Objective</b>	<b>Indicator</b>	<b>Task</b>	<b>Responsible person</b>	<b>Timeline</b>
Provide timely reminders for providers and patients about needed services at time of encounter, or through periodic reporting	Appearance of reminders on computer screen  Generation of monthly report around no of reminders.	-Decide the priority type of alerts needed for each patient. HBIC>9, LDL>130, BP>140/90. -To request from IT department the possibility of installing reminder mark for each file concerning the follow up exams or procedures. Example: eye exam, lipid screening, and referrals (Nephrology, cardiovascular)	Team of Diabetes clinic with the nursing director.	2015
Identify relevant subpopulations for proactive care by clinical priority. For instance, the IT system will be able to come out with list of patients who have more than one chronic disease.  Note: next step feed IT with risk factor list for patient with more than one chronic disease.	System successfully produces these lists, for example: list of patients who have more than one chronic disease	Request from IT department the possibility of programming the computer to give or retract the list of pts with more than one chronic disease.	Nursing director	2015

#### 5.4. The Fourth Goal: Mobilizing Community Resources to Meet the Needs of Patients

The healthcare center can form partnerships with community organizations to support and develop interventions that fill gaps in needed services. The general manager can plan with the administration to ensure a contract with one to two hospitals near the center to send patients needing hospitalization. The indicator of this task is the presence of such contracts. Another task that the general manager can perform is to coordinate with health authorities and funding organizations to cover the hospitalization fees of poor and uncovered patients. The indicator would be the presence of a policy detailing what to be done in case a diabetic patient needs hospitalization and is not able to pay the bill.

Table 5.4: Mobilizing Community Resources to Meet Patients' Needs

Objective	Indicator	Task	Responsible person	Timeline
Form partnerships with community organizations to support and develop interventions that fill gaps in needed services	1-Presence of Memo random of understanding with one or 2 hospitals to accept emergency cases. 2-To find funding organization	1-Recommend to General Manager these 2 points. Plan with administration to ensure a contract with one to two hospitals near the center where to send patient incase need hospitalization.  2-Coordinate with health authorities to organize the provision of resources at the practice level for diabetic management(medication, hospitalization)	General manager	2015-2016



## CHAPTER VI

### CONCLUSION

Based on our study findings, implementing the chronic care model at a Lebanese primary healthcare center is feasible. The primary health care center is found to have acceptable scoring of the elements of the CCM. Yet, the chronic illness care at the center can be improved through the collaborative work of the nursing staff, administration and primary healthcare physicians. For instance, to improve the care delivery system, a strategic plan should be updated by leaders to involve and encourage the staff for better care delivery. In addition, empowering, educating and involving patients in their own health care plan will lead to a better self-management support. As for the information system design, enhancing electronic registry is beneficial to monitor a patient's health and follow up to reduce complications. Finally, the primary health care center in collaboration with other community resources can offer the patients more healthcare services to ensure holistic patient care. Through applying the Chronic Care Model at such primary health care centers, empowered patients and proactive health care professionals will interact to produce enhanced health care outcomes.

# APPENDIX A

## Assessment of Chronic Illness Care, Version 3.5

### Assessment of Chronic Illness Care, Version 3.5

**Part 1: 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
<b>Overall Organizational Leadership in Chronic Illness Care</b>	...does not exist or there is a little interest.	...is reflected in vision statements and business plans, but no resources are specifically earmarked to execute the work.	...is reflected by senior leadership and specific dedicated resources (dollars and personnel).	...is part of the system's long term planning strategy, receive necessary resources, and specific people are held accountable.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Organizational Goals for Chronic Care</b>	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Improvement Strategy for Chronic Illness Care</b>	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Incentives and Regulations for Chronic Illness Care</b>	...are not used to influence clinical performance goals.	...are used to influence utilization and costs of chronic illness care.	...are used to support patient care goals.	...are used to motivate and empower providers to support patient care goals.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Senior Leaders</b>	...discourage enrollment of the chronically ill.	...do not make improvements to chronic illness care a priority.	...encourage improvement efforts in chronic care.	...visibly participate in improvement efforts in chronic care.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Benefits</b>	...discourage patient self-management or system changes.	...neither encourage nor discourage patient self-management or system changes.	...encourage patient self-management or system changes.	...are specifically designed to promote better chronic illness care.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11

Total Health Care Organization Score \_\_\_\_\_ Average Score (Health Care Org. Score / 6) \_\_\_\_\_

**Part 2: Community Linkages.** Linkages between the health delivery system (or provider practice) and community resources play important roles in the management of chronic illness.

Components	Level D	Level C	Level B	Level A
<b>Linking Patients to Outside Resources</b>	... is not done systematically.	... is limited to a list of identified community resources in an accessible format.	... is accomplished through a designated staff person or resource responsible for ensuring providers and patients make maximum use of community resources.	... is accomplished through active coordination between the health system, community service agencies and patients.
Score	0 1 2	3 4 5	6 7 8	9 10 11
<b>Partnerships with Community Organizations</b>	...do not exist.	...are being considered but have not yet been implemented.	...are formed to develop supportive programs and policies.	...are actively sought to develop formal supportive programs and policies across the entire system.
Score	0 1 2	3 4 5	6 7 8	9 10 11
<b>Regional Health Plans</b>	...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.	...currently coordinate guidelines, measures or care resources in one or two chronic illness areas.	...currently coordinate chronic illness guidelines, measures and resources at the practice level for most chronic illnesses.
Score	0 1 2	3 4 5	6 7 8	9 10 11

Total Community Linkages Score \_\_\_\_\_ Average Score (Community Linkages Score / 3) \_\_\_\_\_

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**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 self-management support, delivery system design issues that directly affect the practice, decision support, and clinical information systems.

**Part 3a: Self-Management Support.** Effective 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
<b>Assessment and Documentation of Self-Management Needs and Activities</b>	...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
<b>Self-Management Support</b>	...is limited to the distribution of information (pamphlets, booklets).	...is available by referral to self-management classes or educators.	...is provided by trained clinical educators who are designated to do self-management support, affiliated with each practice, and see patients on referral.	...is 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
<b>Addressing Concerns of Patients and Families</b>	...is not consistently done.	...is provided for specific patients and families 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
<b>Effective Behavior Change Interventions and Peer Support</b>	...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

Total Self-Management Score \_\_\_\_\_ Average Score (Self Management Score / 4) \_\_\_\_\_

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**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
<b>Evidence-Based Guidelines</b>	...are not available.	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Involvement of Specialists in Improving Primary Care</b>	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Provider Education for Chronic Illness Care</b>	...is provided sporadically.	...is provided systematically through traditional methods.	...is provided using optimal methods (e.g. academic detailing).	...includes training all practice teams in chronic illness care methods such as population-based management, and self-management support.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Informing Patients about Guidelines</b>	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11

Total Decision Support Score \_\_\_\_\_ Average Score (Decision Support Score / 4) \_\_\_\_\_

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**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
<b>Practice Team Functioning</b>	...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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Practice Team Leadership</b>	...is not recognized locally or by the system.	...is assumed by the organization to reside in specific organizational roles.	...is assured 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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Appointment System</b>	...can be used to schedule acute care visits, follow-up and preventive visits.	...assures scheduled follow-up with chronically ill patients.	...are 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.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Follow-up</b>	...is scheduled by patients or providers in an ad hoc fashion.	...is scheduled by the practice in accordance with guidelines.	...is assured by the practice team by monitoring patient utilization.	...is customized to patient needs, varies in intensity and methodology (phone, in person, email) and assures guideline follow-up.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Planned Visits for Chronic Illness Care</b>	...are not used.	...are occasionally used for complicated patients.	...are an option for interested patients.	...are used for all patients and include regular assessment, preventive interventions and attention to self-management support.
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11
<b>Continuity of Care</b>	...is not a priority.	...depends on written communication between primary care providers and specialists, case managers or disease management	...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 relevant

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Components	Level D	Level C	Level B	Level A
<b>Score</b>	0 1 2	3 4 5	6 7 8	9 10 11

Total Clinical Information System Score \_\_\_\_\_ Average Score (Clinical Information System Score / 5) \_\_\_\_\_

**Integration of Chronic Care Model Components.** Effective systems of care integrate and combine all elements of the Chronic Care Model; e.g., linking patients' self-management goals to information systems/registries.

Components	Little support	Basic support	Good support	Full support
<b>Informing Patients about Guidelines</b>	... 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
<b>Information Systems/ Registries</b>	... do not include patient self-management goals.	... include results of patient assessments (e.g., functional status rating; readiness to engage in self-management activities), but no goals.	... include results of patient assessments, as well as self-management goals that are developed using input from the practice team/provider and patient.	... include results of patient assessments, as well as self-management goals that are developed using input from the practice 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
<b>Community Programs</b>	... do not provide feedback to the health care system/clinic about patients' progress in their programs.	... provide sporadic feedback at joint meetings between the community and health care systems 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
<b>Organizational Planning for Chronic Illness Care</b>	... 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 self-management programs and partnerships with community resources.	... uses systematic data and input from practice teams to proactively plan population-based care, including the development of 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

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Components	Little support	Basic support	Good support	Full support
<b>Routine follow-up for appointments, patient assessments and goal planning</b>	... 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 practice team.
Score	0 1 2	3 4 5	6 7 8	9 10 11
<b>Guidelines for chronic illness care</b>	... are not shared with patients.	... are given to patients who express a specific interest in self-management of their condition.	... are provided for all patients to help them develop effective self-management or behavior modification programs, and identify when they should see a provider.	... are reviewed by the practice team with the patient to devise a 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

Total Integration Score (SUM items): \_\_\_\_\_ ➤ Average Score (Integration Score/ 6) = \_\_\_\_\_

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