APPLYING THE CHRONIC CARE MODEL TO DIABETES MELLITUS:

DOES ITS APPLICATION IMPROVE DIABETES MELLITUS OUTCOME?

A LITERATURE REVIEW

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OUTLINE OF THE PROJECT:

Section 1:
- Review literature regarding the Chronic Care Model (CCM) and Diabetes Mellitus (DM)
- Review specific articles regarding CCM and DM in clinics involved in Graduate Medical Education (GME)

Section 2:
- Discussion on how to apply CCM at an outpatient Family Medicine Residency Clinic (FMR)
SECTION 1: INTRODUCTION: EPIDEMIOLOGIC TRANSITION & DEFINITION OF CHRONIC DISEASE

- The US and other developed countries have undergone an epidemiologic transition:
  - shift from primarily infectious /communicable diseases to chronic or degenerative diseases

- Chronic disease is defined as an illness longer than 3 months
INTRODUCTION: BURDEN OF CHRONIC DISEASE

- Almost half of the US population (100 million individuals) are affected by a chronic illness.

- Chronic conditions account for 78% of health care costs in the US:
  - 76% of all hospital admissions
  - 88% of all prescription drugs

- Overall direct costs of chronic conditions:
  - 425 billion
**Introduction: Diabetes Mellitus: The Most Common Chronic Condition**

- Prevalence of 23.6 million or 7.8% of the population in 2007
- Incidence of 1.6 million in 2007
INTRODUCTION:
DIABETES MELLITUS

- 7th leading cause of death
- Leading cause of new cases of blindness and renal failure
- Responsible for 60% of non traumatic limb amputations
- Cost: 16 billion of direct medical costs in 2007
Findings:

- Poorly organized health care delivery system for people for chronic conditions
- Current system of care is designed for acute rather than chronic care
- “Patients with chronic conditions need continuous and coordinated healing relationship”
INTRODUCTION:
THE CHRONIC CARE MODEL
INTRODUCTION: CHRONIC CARE MODEL

- Chronic Disease Management program that:
  - Promotes system change (redesign) at the physician and patient level
  - Has the goal of improving care for people with chronic diseases

- Identifies 6 essential elements:
  - Community
    - goal is to mobilize community resources
  - Health Care Systems Organization
    - goal is to provide incentives for safe, high quality care
  - Self Management Support
    - goal is to empower and prepare patients to manage their health care
INTRODUCTION: CHRONIC CARE MODEL

6 essential elements (cont):

- **Delivery System Design**
  - goal is to assure effective, efficient and self-management support

- **Decision support**
  - goal is to promote care consistent with scientific data and patient preferences

- **Clinical information systems**
  - goal is to organize data to facilitate efficient and effective care
INTRODUCTION: RESIDENCY TRAINING: ACGME

- Accreditation Council for Graduate Medical Education (ACGME) competencies in areas:
  - Medical knowledge
  - Patient Care
  - Interpersonal and Education Skills
  - Professionalism
  - Practice Based Learning and Improvement (PBLI)
    - ability to analyze and assess practice experience and perform practice based improvement
  - Systems Based Practice (SBP)
    - demonstrate knowledge of the environmental context and health care systems.
SECTION 1: METHODS

- Search through the United States National Library of Medicine Database (PUBMED)
- Medical Subject Headings (MeSH) and phrases: “Chronic Care Model”, “chronic care”, patient outcomes, Diabetes Mellitus, internship and residency, education medical, graduate
- Diabetes mellitus AND “chronic care model” : 65 citations
- Diabetes mellitus AND internship and residency AND “chronic care model” : 5 citations
RESULTS:

- Multiple studies have evaluated the effect of the application of 1-2 elements of the CCM on patient outcomes.
- Few investigators have implemented all components.
  - In the review article by Bodenheimer:
    - 55% of publications contained only 1-2 elements.
    - 12% of publications contained 4 or more elements.
RESULTS: REVIEW OF CCM INTERVENTIONS

- Patients with DM cared for in practices that had implemented the CCM experienced reduced risk of cardiovascular events

- Community Health Center Collaboratives showed improved processes of care and patient outcomes if follow up was extended for 3 years after implementation of the CCM

- Meta-analysis “overall effectiveness of interventions with one or more CCM elements led to improvements in patient outcomes”
RESULTS: CCM IN GRADUATE MEDICAL EDUCATION (GME)

- 5 studies addressed the effects of the application of the CCM in clinics participating in GME
- 2 implemented the CCM in primary care setting and reported in patients’ outcomes:
  - Di Piero and colleagues: hospital based general internal medicine practice
  - Landis and colleagues: community based family medicine residency clinics
RESULTS: CCM IN GRADUATE MEDICAL EDUCATION (GME) – DiPiero study:

- Patients in intervention group (CCM group):
  - Had increased likelihood of
    - having assessed Blood Pressure (BP)
    - having LDL-C
    - having foot and eye exam
    - receiving pneumococcal vaccine
    - setting self management goals.

- Participation on CCM group did not increase likelihood of having a HbA1c or influenza vaccine.

- Odds of having HbA1c < 7% and BP <130/80 was significantly improved in CCM group.

- Odds of having target LDL-C was not significant.
RESULTS: CCM IN GRADUATE MEDICAL EDUCATION (GME) – LANDIS STUDY:

- Learning collaborative among 6 residency program sites
- Quality Improvement teams in 6 different sites focused on each of the 6 elements of the CCM
- Goal was to meet or exceed at least one target set by the Physician Recognition Program (PRP)
- PRP is a voluntary program developed by the National Committee of Quality Assurance and American Diabetic Association
MEASURES IN PRP:
- HbA1C <8%
- Percentage of patients with a foot and eye exam within 1 year of the clinic visit
- Percentage of people with a urine micro-albumin test, etc.

4 of the 6 sites met or exceeded at least 1 PRP target for diabetes care that they had not previously met.

3 of the 6 sites met or exceeded 2 diabetes targets.

CONCLUSION:

“the collaborative resulted in improved diabetes care in practices that had formerly used quality improvement techniques and especially in sites with a history of organizational change and involvement of residents.”
RESULTS: CCM IN GRADUATE MEDICAL EDUCATION (GME)

- Application of the CCM has allowed teaching of 6 ACGME competencies

- Barriers to application of CCM in residency training:
  - Lack of information technology support
  - Discomfort with the emphasis in self management
  - Feeling threatened by the implication of provider accountability of panel outcomes
  - Productivity requirements set by the Residency Review Committee.
SECTION 2:
APPLICATION OF THE CCM AT A FAMILY MEDICINE RESIDENCY TRAINING CLINIC

GOAL: Identify opportunities in order to adopt the CCM at a Family Medicine Residency Training Clinic in order to:

- Improve care of patients with DM
- Utilize the CCM as training opportunity for:
  - Core residency competencies
  - Activities related to Maintenance of Certification (MOC)
APPLICATION OF THE CCM TO A FAMILY MEDICINE RESIDENCY TRAINING CLINIC

- Improve community linkages by working with community partners specially the local Emergency Department
- Promote patient and family self management:
  - Train staff member as a Certified Diabetes Educator and in Chronic Disease Self Management
- Modify delivery system design:
  - Provide planned visits for patients with chronic conditions including DM
  - Provide case management services
  - Organize and identify roles for each team member
APPLICATION OF THE CCM TO A FAMILY MEDICINE RESIDENCY TRAINING CLINIC

- Optimize information systems and decision support by:
  - Adoption of a registry
  - Incorporating guidelines into clinical practice

- Adopt the Model for Improvement:
  - As a quality improvement tool
  - As a teaching tool for PBLI
  - As a tool for aiding in MOC
CONCLUSION:

- DM and other chronic conditions area a major challenge and cost for the health care system
- CCM is a model that through 6 elements intends to transform care for chronic conditions
- Application of multiple elements of the CCM improved processes of care and in some studies also patient outcomes
- Adopting the CCM in GME clinics can:
  - Promote awareness of the need for system change
  - Aid in the teaching of 6 core ACGME competencies
  - Aid in the training of MOC certification process
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