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Family Physician Perceptions of the Role and Value of the Clinical Pharmacist in the Management of Patients with Type 2 Diabetes

Running Title: Pharmacist Contribution in T2DM Care

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Abstract

Purpose: Clinical pharmacists can help primary care physicians (PCPs) manage medications for patients with poorly controlled type 2 diabetes. Studies have shown that clinical pharmacist involvement in care can improve outcomes such as glycosylated hemoglobin (A1C), blood pressure and lipid control, and decrease episodes of hypoglycemia. Despite these findings, some PCPs may be slow or disinclined to refer to clinical pharmacists when available. This study addressed PCP perceptions regarding referral to clinical pharmacists and endocrinologists for patients with poorly controlled type 2 diabetes.

Methods: Physicians from five family medicine sites were surveyed. Physicians were queried regarding their patterns for patient referral to endocrinologists and/or clinical pharmacists. Clinical contributions and importance of factors to consider when referring were compared between clinical pharmacists and endocrinologists using paired t-tests.

Results: Fifty physicians responded to the survey, resulting in a response rate of 73.5%. The majority of PCPs indicated that they have referred to endocrinologists (89.5%) and clinical pharmacists (93.5%) for specialty care. PCPs tended to refer to clinical pharmacists sooner and at lower A1C values than to endocrinologists. PCPs also considered multiple medical comorbidities, history of non-compliance with medical recommendations, low reading ability or math skills, complex psychosocial situations, fear of needles, or difficulty affording medications or supplies to be more important when referring patients to clinical pharmacists than endocrinologists.

Conclusion: We hypothesized that referrals to a clinical pharmacist or endocrinologist are made with careful consideration of the patients' needs. PCPs reported increased utilization of clinical pharmacists for patients with non-medical needs, indicating that extra time, education, and psychosocial support provided by the clinical pharmacist is highly valued.

Keywords: Physician, Primary Care, Pharmacist, Glycated Hemoglobin A, Diabetes Mellitus, Type 2, Endocrinologists, Referral and Consultation

From 1980 to 2012, the number of adults diagnosed with diabetes in the United States nearly quadrupled from 5.5 million to 21.3 million[1]. If this trend continues, as many as one in three adults in the US could have diabetes by 2050, leading to a significantly increased disease burden and cost to the US health care system.[1,2] Diabetes is a complex, chronic illness requiring a multi-faceted, team-based approach to care.[3] Ongoing patient support and emphasis on self-management skills are crucial to preventing complications and improving outcomes in patients with diabetes. In this context, roles of clinical pharmacists are expanding in the management of diabetes in the primary care setting with the expanding role of the Patient Centered Medical Home (PCMH) model.[4,5]

Clinical pharmacists are ideally suited to help primary care physicians (PCPs) manage medications for patients diagnosed with type 2 diabetes mellitus (T2DM) who struggle to achieve glycemic control. As defined by the American College of Clinical Pharmacy, clinical pharmacy is a "health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention."[6] Clinical pharmacists can help patients with poorly controlled T2DM overcome psychological insulin

resistance and other disease management barriers. Clinical pharmacists perform many additional professional interventions that are helpful for patients with diabetes and their prescribers, such as optimize insulin and oral antidiabetic medication doses, monitor for side effects, and assess and manage drug interactions.

Emerging evidence shows that clinical pharmacists can positively impact T2DM-related outcomes. Multiple studies have demonstrated that when pharmacists are added to the health care team in providing diabetes management, an improvement in glycosylated hemoglobin (A1C) is seen.[4, 7-9] Studies have demonstrated that collaborative management between PCPs and clinical pharmacists can lead to improved blood pressure control, improved lipid profiles, decreased episodes of hypoglycemia and emergency room visits, and increased preventative services (e.g., dilated eye exams, foot exams).[4,9-15] Incorporating clinical pharmacists into the care team has demonstrated cost savings and improved quality-adjusted life years.[16,17]

An important component of patient-centered care is shared decision-making characterized by effective patient-provider communication, where patients weigh treatment choices in light of the potential benefit and harm and arrive at informed preferences.[18,19] While current evidence is insufficient to fully assess the impact of PCMH and shared decision-making[19,23] on most quality and economic outcomes, both PCMH[20,22] and shared decision-making continue to hold promise for improving the quality and cost-effectiveness of health care. PCMH and shared decision-making are especially important in the management of chronic diseases such as T2DM. Patients typically develop long-term relationships with health care providers and, over the progression of the disease, must repeatedly assess the pros and cons of various medications and lifestyle changes to achieve treatment goals.[24-27]

This quality interaction with patients, though recognized as value-added care, can be time-consuming for PCPs working under a fee-for-service reimbursement paradigm. However, clinical pharmacist consultation is covered under care management benefits of many commercial payers. The extra time allotted by this funding can be utilized to educate patients on the importance of lifestyle modification and how individual medications function to improve T2DM, and help facilitate shared decision-making through close collaboration and frequent contact with the patient.

Despite clinical pharmacists' success in medication therapy management and other disease-management activities, PCPs may be slow or otherwise disinclined to refer patients. Factors contributing to this delay could include a perceived lack of mandate, legitimacy, or effectiveness of the specialty service;[29] lack of knowledge on the appropriate referral procedure;[29] perceived lack of professionally constructive communication between clinical pharmacists and PCPs;[30] misperceptions or negative biases toward the role of clinical pharmacists within the primary care setting;[31] concern about compensation/reimbursement;[32] lack of a trusting relationship with the ancillary providers (i.e., clinical pharmacists) ;[32] discomfort with the potential impact the clinical pharmacist could have on patients' overall medical follow-up;[33] and worry that the patient-physician relationship could be altered or compromised.[33]

The data presented in this paper were drawn from a larger study on patient and physician attitudes toward insulin initiation and the role of the clinical pharmacist. Here we aimed to answer several questions targeted at PCP perceptions about patient disease management needs and factors that are considered when deciding when to refer patients to a clinical pharmacist for management of T2DM. In particular, we address how PCPs determine whether to manage insulin alone or refer to a clinical pharmacist or endocrinologist, and PCPs perceptions regarding the

clinical contribution of the endocrinologist versus the clinical pharmacist. Additionally, we examined PCPs perceptions of factors that influence initiation of insulin therapy in poorly controlled patients.

We anticipated that PCPs consider different factors when deciding whether to refer patients to a clinical pharmacist versus an endocrinologist. The perceived contribution to patient disease management from external subspecialist consultation versus clinical pharmacist under the direction of the PCP is likely to depend on medical and social complexity. These factors are patient-specific and would have to be considered on a case-by-case basis, but trends were expected to indicate that PCPs prefer to keep patients within their practice if possible.

Methods

This was a qualitative survey of physician attitudes toward referral. The physician sample was drawn from five University of Michigan Department of Family Medicine (DFM) primary care clinics in and around the Greater Ann Arbor, Michigan area. Together, these clinics provide primary health care services to a diverse patient population, with two clinics serving a mostly rural population, two serving a suburban population, and one a largely minority, socioeconomically disadvantaged population. All sites host a clinical pharmacist for either one or two 4-hour sessions per week. The clinical pharmacist has a schedule that is managed by the clinical site, with 60 minutes allowed for new patient consultations and 30 minutes for follow-up consultations. All DFM physicians were targeted for recruitment, with the exception of those listed on the grant or who participated in a review of questionnaires (n=68). Advanced practice providers do not function as PCPs in our system, therefore they were not included in the study.

This study was reviewed and approved by the University of Michigan IRB (#HUM00084901). Funding for this project was provided by the Blue Cross and Blue Shield of Michigan Foundation.

Investigators developed a questionnaire for this study. A grounded, iterative revision process was employed, wherein study investigators and an advisory panel of experienced physician researchers piloted and modified the instrument over the course of five months and in excess of 11 iterations until 100% consensus on both the instrument's content and layout was achieved. In its final form, the instrument included 143 questions and required approximately 15-20 minutes to complete. The survey was sent by email to recruited physicians, with a total of three reminders. Topics covered by the instrument and analyzed here included demographics, assessing when PCPs refer patients to a specialty or ancillary provider for care, factors to consider when referring, and PCP perceptions regarding specialty or ancillary providers' contribution to care. PCPs' perception of the importance of 12 different factors to consider when referring patients to an endocrinologist or clinical pharmacist was assessed using a ten-point scale ranging from not at all important to extremely important. Clinical contributions of providers on six different items were also measured using a five-point Likert scale ranging from strongly disagree to strongly agree.

Demographics and PCPs responses to experience with specialty providers and common practice of insulin initiation were assessed using descriptive statistics. PCPs responses to A1C values and length of time patients were poorly managed prior to referral were compared between endocrinologist and clinical pharmacists using linear mixed models to account for provider clustering. Clinical contributions and importance of factors to consider when referring patients were compared between clinical pharmacists and endocrinologists using paired t-tests.

Results

A total of 50 DFM physicians responded to the online survey, resulting in a final response rate of 73.5%. Respondents were roughly split between male and female (40% male, 60% female), and ranged in years of experience. Approximately a third of the sample (29%) practiced for less than 5 years, 18% practiced for over 20 years, and the rest were distributed between 6-10 years (17%), 11-15 years (23%) and 16-20 years (13%). Most participants saw patients for at least half of their working time (80%). The average number of adult patients with T2DM seen during a typical clinic session was reported at 2.19 (standard deviation [SD] = 0.97).

When asked about their practice when confronted with a patient requiring insulin therapy, 66% of participants indicated that they usually initiate but sometimes refer patients to endocrine, clinical pharmacist, or other provider. Twenty-two percent indicated that they sometimes initiate but usually refer patients to endocrine, clinical pharmacist, or other provider. Only 4% indicated that they never initiate insulin, and 8% indicated that they always initiate insulin themselves.

The majority of PCPs indicated that they have referred patients to endocrinologists (89.5%) and clinical pharmacists (93.5%) for T2DM, whether it be for insulin initiation or other management. PCPs tended to refer patients to clinical pharmacists sooner and at lower values of A1C than to endocrinologists. Average A1C value at which participants indicated that they would refer patients to an endocrinologist was 9.6% (SD = 0.9) and 8.4% (SD = 0.9) for clinical pharmacists (p<0.001). The average length of time that a patient had poorly controlled diabetes before referral was reported to be 6.7 (SD = 3.1) months for an endocrinologist and 4.8 (SD = 2.9) months for a clinical pharmacist (p<0.001).

Table 1 demonstrates that PCPs were more likely to refer patients to clinical pharmacists if patients had higher comorbidity (p=0.004), a history of medical non-compliance (p=0.001), low reading or math skills (p<0.001), more complex psychosocial situations (p<0.001), fear of needles (p<0.001), and inability to meet medication and supply expense (p<0.001). Table 2 shows the PCP perception of clinical contribution of endocrinologists and clinical pharmacists. Participants rated clinical pharmacists having a stronger contribution to the clinical care of patients in all items.

Discussion

PCP perceptions indicated that T2DM patients working with a clinical pharmacist had better disease control after the first visit. Access to the clinical pharmacist and participating in team-based care were also noted to be benefits. PCPs were more likely to refer patients with less poorly controlled disease (lower A1C value) to a clinical pharmacist as opposed to an endocrinologist, as well as patients with a shorter history of poor control. It is notable that PCPs found higher importance when referring patients to the clinical pharmacist in patients with higher non-medical complexity, such as history of non-compliance, low reading ability or math skill, complex psychosocial situation, being afraid of needles, and difficulty meeting the expenses of medication or supplies.

Patient self-management support is important in the care of patients with T2DM and requires assessing and meeting the needs of individual patients on a case-by-case basis. A variety of professions, including clinical pharmacists, certified diabetes educators, and dieticians can be included in the PCMH care team to meet the individual needs of patients.   Some patients may

benefit more from the care of a specialty provider. Our sample of physicians reported a large overlap in utilization of endocrinologist (89.5%) and clinical pharmacist (93.7%) referrals. We hypothesized that referrals are made with careful consideration of the needs of the patient. PCPs reported increased utilization of clinical pharmacists for patients with non-medical needs, indicating that the extra time, education, and psychosocial support provided by the clinical pharmacist is highly valued.

The majority (66%) of PCPs in our study reported that they usually initiate insulin but sometimes refer patients to an endocrinologist or clinical pharmacist, while another 22% reported that they sometimes initiate insulin but usually refer patients. A recent study surveyed multiple providers (endocrinologist, family physicians, internal medicine physicians, primary care nurse practitioners and physician assistants, and pharmacists) to identify attitudes and practices regarding management of T2DM found that PCPs lack confidence in prescribing insulin regimens more complex than long acting insulin alone, and clinical pharmacists have an increased comfort in discussing long-acting basal insulin.[34]

Clinical pharmacists are ideally suited as permanent members of the collaborative interprofessional team for patients with T2DM due to their expertise in pharmacotherapy options, training in patient self-management, and their emphasis on patient education. Clinical pharmacists have a theoretical advantage given that they can offer longer visits (or more time with the patient) and may be more accessible than PCPs or endocrinologists. These advantages were reflected in PCP responses as physicians reported significantly better access to care with a clinical pharmacist as opposed to an endocrinologist. The importance of the clinical pharmacist as a valued member of the care team was also notable. Patients were

referred earlier and with a lower A1C value than compared with endocrinologists. PCPs may value reserving referrals to endocrinologists for patients with persistently poorly controlled disease, as these specialists may be perceived as better equipped to respond to increased medical complexity. In contrast, PCPs may value keeping less critical patients within their own practice under the care of the clinical pharmacist perhaps because of the longer visits and specialized training in facilitating goal-focused lifestyle changes. Additionally, PCPs reported strong working relationships and excellent communication with clinical pharmacists and felt that they were active participants in the team-based approach to T2DM.

The University of Michigan has a robust clinical pharmacy program with financial and administrative support from both the Medical School and the College of Pharmacy. All adult primary care clinics employ the services of a clinical pharmacist for four or eight hours a week. This availability drives referrals toward the clinical pharmacist within the primary care site. Our PCPs practice in a large tertiary care health system, with financial support for team members provided by commercial and federal PCMH demonstration projects.   However, embedded clinical pharmacists may not be available or financially feasible by many private PCPs, particularly in the current fee-for-service paradigm. If primary care moves to a more comprehensive payment strategy, incorporation of clinical pharmacists shows significant promise to improve patient outcomes.

Conclusion

This study demonstrated that PCPs value the contribution of the clinical pharmacist as a member of the care team, and as a distinct entity from endocrinologist specialty care. More

research is needed to further explore patients' perceptions of working with clinical pharmacists in the primary care setting, and the impact that clinical pharmacists have on overall attitudes towards managing T2DM. Future directions could also include further quantifying the financial impact of adding clinical pharmacists to the primary care team, as presumably improving disease specific outcomes and avoiding disease complications via improved preventative measures and patient education should result in significant cost savings, given the large financial burden of caring for patients with T2DM. Additional investigations could address whether a difference exists between providers of timing of insulin initiation based upon uncontrolled disease and any resulting cost savings.

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Table 1. Factors Considered when Referring Patients to a Clinical Pharmacist and Endocrinologist (10-Point Scale)			
	Clinical Pharmacist, mean (SD)	Endocrinologist, mean (SD)	p-value
Excess weight gain is a concern	3.3 (2.5)	2.7 (1.8)	0.13
The patient has multiple comorbidities	5.9 (2.6)	4.6 (2.7)	**0.004**
The patient is medically frail	5.5 (2.7)	5.0 (2.4)	0.19
Congestive heart failure is a concern	3.8 (2.3)	3.6 (2.2)	0.52
Kidney disease is a concern	4.7 (2.6)	4.1 (2.3)	0.17
Uncertainty about which insulin to prescribe	6.0 (3.1)	5.2 (2.6)	0.11
The patient has a history of non-compliance with medical recommendations	7.2 (2.1)	5.8 (2.6)	**0.001**
The patient is emotionally labile	3.5 (2.7)	2.7 (1.8)	0.14
The patient has very low reading ability and/or math skill	5.5 (2.6)	2.6 (2.0)	**<0.001**
The patient has a complex psychosocial situation	4.9 (2.9)	3.0 (1.9)	**<0.001**
The patient reports being afraid of needles	4.5 (2.8)	2.5 (1.7)	**<0.001**
The patient has difficulty meeting the expense of medications and/or related supplies (for example, test strips)	6.9 (2.5)	2.7 (1.9)	**<0.001**

SD = standard deviation.

Table 2. Perceived Clinical Contributions of Providers (_P_) (5-Point Scale)			
	Clinical Pharmacist, mean (SD)	**Endocrinologist, mean (SD)**	**p-value**
My patients with diabetes are always able to access the _P_ when needed	4.0 (0.8)	2.9 (1.0)	**<0.001**
I have a positive working relationship with the _P_ that provides care to my patients	4.8 (0.5)	3.4 (0.8)	**<0.001**
_P_ provides excellent communication to me about the care they provide to my patients	4.9 (0.4)	3.2 (0.9)	**<0.001**
_P's_ are active participants in the team-based approach to providing diabetes care—that is, they work collaboratively with patients and the primary care provider to accomplish shared goals and to achieve coordinated, high-quality care	4.9 (0.3)	3.0 (0.8)	**<0.001**
The time from referral to the _P_ to the patient's first appointment with the clinical pharmacist is acceptably short	4.3 (0.6)	2.5 (1.0)	**<0.001**
Patients' control over their disease is improved after having seen the _P_	4.4 (0.5)	3.4 (0.6)	**<0.001**

SD = standard deviation.