Impact of a Standardized Patient Referral Process for Pharmacist-provided Collaborative Drug Therapy Management on Access to and Quality of Care

**Investigator**
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**Background**
- Collaborative drug therapy management (CDTM) by pharmacists increases patients’ access to high quality care and improves medication-related outcomes using a team based approach.\(^1,2\)
- The values of CDTM in the medical home include improved clinical outcomes, increased attention to medications, and saved physician time.\(^1,2\)
- Prior to the standardized electronic process, patients were referred to the pharmacist for CDTM following only physician referral.
- Baseline clinic time to see a provider is 2 weeks for an established patient and 5 months for a new patient.

**Methods**

**Purpose:** Increase patient access to and quality of care after implementation of a standardized electronic patient referral process to an ambulatory care pharmacist for management of hypertension and/or diabetes mellitus
- Prospective, single-center, interventional study
- Study groups
  - Historical control group (November 15, 2015 – January 31, 2016)
  - Intervention group (December 15, 2016 – February 28, 2017)

**Eligibility Criteria**

**Inclusion Criteria**
- Billings Clinic downtown provider

**Exclusion Criteria**
- Physician resident

**Primary Outcome**
- Percentage of referred patients who attended their initial appointment with the pharmacist

**Secondary Outcomes**
- No show rates to initial appointment with pharmacist
- Changes in hemoglobin A1c and blood pressure
- Provider satisfaction pre- and post-intervention

**Eligibility Criteria - Patients**

<table>
<thead>
<tr>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Groups</td>
<td></td>
</tr>
<tr>
<td>• Age 18 - 80 years</td>
<td>• Patient already seeing pharmacist</td>
</tr>
<tr>
<td>• Hemoglobin A1c &gt;9% and/or</td>
<td>• No hypertension diagnosis</td>
</tr>
<tr>
<td>• Blood pressure &gt;150/90 mmHg and eGFR 10-50 mL/minute in last 6 months</td>
<td>• Quality measures completed during a hospitalization or outpatient surgery</td>
</tr>
<tr>
<td>• Attended ≥1 appointment with a BC downtown PCP in clinic in the last year</td>
<td>• Other reasons identified by clinical pharmacist</td>
</tr>
<tr>
<td>Intervention Group</td>
<td></td>
</tr>
<tr>
<td>-Identified by the standardized electronic referral process</td>
<td></td>
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BC: Billings Clinic, eGFR: estimated glomerular filtration rate, mL: milliliter, PCP: primary care provider

**Study Timeline**

- **September 2016**
  - Electronic referral development
- **November 2016**
  - Provider acceptance and medical assistant education
- **December 2016**
  - Pre-intervention provider survey and electronic referral implementation
- **March 2017**
  - Data collection and post implementation provider survey
- **April 2017**
  - Data collection and provider update

**Intervention Workflow**
System identified patient based on inclusion criteria
Electronic referral fired to pharmacist scheduling queue
Medical assistant contacted patient by phone x3 to schedule CDTM consultation with pharmacist
CDTM conducted by pharmacist for diabetes mellitus and hypertension
Follow up with pharmacist as needed

References
## Results

### Baseline Demographics

<table>
<thead>
<tr>
<th>Baseline Characteristics</th>
<th>Intervention (n=135)</th>
<th>Control (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean years ± SD</td>
<td>62.8 ± 12</td>
<td>59.5 ± 11.9</td>
</tr>
<tr>
<td>Females, n (%)</td>
<td>79 (59)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Comorbidities, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>22 (16)</td>
<td>1 (17)</td>
</tr>
<tr>
<td>Current or former smoker</td>
<td>67 (50)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>105 (76)</td>
<td>5 (83)</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>86 (64)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>107 (79)</td>
<td>4 (67)</td>
</tr>
<tr>
<td>Microalbuminuria/proteinuria</td>
<td>10 (7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Obesity</td>
<td>57 (42)</td>
<td>3 (50)</td>
</tr>
</tbody>
</table>

### Appointment Results

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible patients, n</td>
<td>135</td>
</tr>
<tr>
<td>Referred patients, n (%)</td>
<td>135/135 (100)</td>
</tr>
<tr>
<td>Referred patients scheduled, n (%)</td>
<td>46/135 (34.1)</td>
</tr>
<tr>
<td>Referred patients who attended first appointment, n (%)</td>
<td>35/135 (25.9)</td>
</tr>
<tr>
<td>Scheduled patients who attended first appointment, n (%)</td>
<td>35/135 (76.1)</td>
</tr>
<tr>
<td>Scheduled patients who no-showed first appointment, n (%)</td>
<td>11/46 (23.3)</td>
</tr>
<tr>
<td>Time to see pharmacist, mean days ± SD</td>
<td>11.8 ± 10.6</td>
</tr>
</tbody>
</table>

### Secondary Outcome – Provider Satisfaction

<table>
<thead>
<tr>
<th>Question/Statement</th>
<th>Answer, n (%)</th>
<th>Pre-Intervention (n=8)</th>
<th>Post-Intervention (n=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfied with new process</td>
<td>Strongly Agree Agree Neutral</td>
<td>-----</td>
<td>2 (33.3) 3 (50) 1 (16.7)</td>
</tr>
<tr>
<td>Better understanding of medications</td>
<td>Strongly Agree Agree</td>
<td>6 (75) 2 (25)</td>
<td>5 (83.3) 1 (16.7)</td>
</tr>
<tr>
<td>Better control of disease states</td>
<td>Strongly Agree Agree</td>
<td>4 (50) 4 (50)</td>
<td>5 (83.3) 1 (16.7)</td>
</tr>
<tr>
<td>Increased access to high quality care</td>
<td>Strongly Agree Agree</td>
<td>6 (75) 2 (25)</td>
<td>5 (83.3) 1 (16.7)</td>
</tr>
<tr>
<td>Benefit from having pharmacist as part of team</td>
<td>Strongly Agree Agree</td>
<td>6 (75) 2 (25)</td>
<td>6 (100)</td>
</tr>
<tr>
<td>Satisfied with the clinical pharmacist</td>
<td>Strongly Agree Agree</td>
<td>6 (75) 2 (25)</td>
<td>6 (100)</td>
</tr>
</tbody>
</table>

### Discussion

- 1st study to evaluate the impact of an electronic referral process with pharmacist interventions and access to care
- Increased pharmacist referral rates for hypertension and diabetes mellitus by over 95%
- Decreased appointment no show rates with electronic referral by 36%
- Providers have increased satisfaction of pharmacist-provided care post-intervention

### Limitations

- Pharmacist beginning services in control group time frame
- Only one pharmacist with other responsibilities leading to scheduling barriers
- Short study duration
- Clinically inappropriate referrals

### Conclusions

- Electronic, standardized referral system that identifies adult patients with uncontrolled hypertension or diabetes mellitus may increase patients’ access to and quality of care

### Lessons Learned

- Close relationship with informatics team
- Continually look for ways to improve and refine referral process

### References

• Importance of medical assistant training on phone calls to patients
• Coordination and collaboration with inter-professional teams

References