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State University Partnership Research Brief
A Study on Type 2 Diabetes Mellitus for Patients Among Medicaid Beneficiaries in Kentucky

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What is Known on This Topic?
Diabetes Mellitus is a major health issue in the state of Kentucky – one that costs Medicaid millions of dollars in coverage for healthcare services. An increasing amount of evidence has shown that using a team-based approach that incorporates a pharmacist and the patient themselves in the construction of a treatment plan can lead to higher patient adherence and lower medical costs.

What Did this Project Do?
This study explored the impact of using an electronic clinical decision support tool (CDS) along with a team-based approach to quality of care, patient engagement, and costs of care for patients with diabetes. The program involved training participating physicians to use a CDS tool alongside a pharmacist to recommend appropriate treatment regimens to Medicaid patients with a diagnosis of uncontrolled diabetes (A1c$\geq$8%).

What Could Medicaid Do with These Conclusions?
This study suggests that the use of team-based care alongside a CDS tool may be able to improve outcomes and lower costs for Kentucky Medicaid patients with uncontrolled diabetes.

Introduction

Diabetes in Kentucky and the Concept of Clinical Inertia

Over a 17 year period from 2000-2017, the rate of diabetes among Kentucky adults nearly doubled from 6.5% to over 12.9%. In 2017, 16.2% of adult Medicaid beneficiaries had a diabetes diagnosis. In terms of Medicaid expenditures, diabetes is the 3rd most expensive chronic disease to the program. One major reason is *clinical inertia*, which is defined as the failure of healthcare providers to appropriately initiate or intensify treatment. The prevalence of clinical inertia in diabetes treatment is well-documented. There are over 160 drugs that are used to treat diabetes; this complexity of alternatives results in clinical inertia when providers aren't sure how to proceed. Research has found that a combination of patient engagement strategies, team-based care, and clinical decision support tools are often effective in resolving clinical inertia.

Table 1: *Diabetes in the Kentucky Adult Medicaid Population (2017)*

Prevalence of Diabetes in the Medicaid Adult Population		
Characteristic	Diabetes Prevalence	Number with Diabetes
Adults Age 19 and Older		
All Adults	16.2%	165,110
Gender		
Men	15.0%	66,153
Women	17.2%	98,957
Age		
18-44	8.2%	37,290
45-64	23.0%	39,625
55-64	31.9%	47,336
65+ not eligible for Medicare	38.9%	40,859
Race/Ethnicity		
White	15.5%	109,957
African-American	14.5%	14,253
Hispanic	11.1%	1,825
All Other or Unknown	20.3%	38,805
Geography		
Appalachia	18.6%	71,756
Non-Appalachia	14.8%	93,347
Unknown or Out of State	.01%	7
Metro	14.2%	55,927
Non-Metro	17.5%	109,176
Unknown or Out of State	.01%	7

Patient Engagement, Team-based Care, & CDS Tools

Patient engagement in constructing a treatment plan is a major contributor to improving health outcomes in diabetes management. By utilizing a team-based approach where the patient is engaged by the pharmacist, patients can agree on a plan that best suits their personal preferences and lifestyles. Research shows a consistent positive relationship between improvement in clinical measures for patients with diabetes when pharmacists are actively involved in their treatment plan.[1] Clinical inertia can also be reduced by having pharmacists review current drug regimens for potential improvement by using a process that is congruent to the workflow of the provider, and supports follow-up through the health system. There is a substantial amount of research on using CDS tools to address diabetes treatment.[2] These tools use algorithms based on a patient's clinical data, social determinants, and costs to recommend treatment alternatives to help lessen the complexity of treatment options.

Project Methods and Results

Project Design

This project was designed to directly address the problem of diabetes in the Kentucky Medicaid population by developing an intervention to improve quality of care, improve patient engagement, and lower costs. This project implemented a combination of a patient engagement tool, team-based care, and a CDS tool within the St. Elizabeth Healthcare system. The study used a CDS tool designed to enhance team-based workflow named GlucosePATH, a product of Path Decision Support Software LLC.

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GlucosePATH weighs factors that affect patient adherence – such as medication cost and lifestyle factors, along with patient clinical data to suggest a treatment regimen to physicians. The treatment and control groups consisted of Kentucky Medicaid beneficiaries with poorly controlled diabetes mellitus (defined as having an A1c≥8%) that were treated by St. Elizabeth Healthcare providers. The control group consisted of 147 patients and the experimental treatment group consisted of 156 patients. This study involved 43 participating physicians who received training on how to use GlucosePATH. Providers entered into a physician/pharmacist collaborative care agreement, which allowed pharmacists to provide patient education and counseling (including working with patients to ensure they could afford their medications). Patients were designated as belonging to 1 of 4 possible sub-groups: (1) fully followed the recommended plan; (2) partially followed the recommended plan; (3) no change and; (4) an alternate regimen not recommended by the CDS.

Results

The study found that each of the experimental treatment groups that incorporated a CDS-recommended change to the treatment regimen showed a statistically significant improvement in patients' A1c. Partially following the recommendation yielded a 20.9% reduction in A1c measure. Fully following the recommendation yielded a 17.8% reduction in A1c measure. Changing treatment to an alternative not suggested by the CDS tool yielded a 13.7% reduction in A1c measure. No change in the treatment regimen yielded no statistically significant change in A1c measure. Preventable hospitalizations were substantially lower for the experimental treatment group compared to the control group of patients over the course of the study (see Table 3).

Table 2: *Final A1c by Patient Adherance Category*

Recommendation	A1c Decline Mean	Std. Deviation	95% Confidence Interval for Mean Decline Lower Bound	95% Confidence Interval for Mean Decline Upper Bound	Min	Max	A1c Percentage Decline
Partial	-2.33	2.69	-3.67	-0.99	-7.30	6.30	-20.96%
Full	-2.03	2.72	-2.66	-1.40	-8.90	5.60	-17.80%
Alternate	-1.48	2.08	-2.40	-0.56	-5.70	1.90	-13.66%
No change	0.42	3.37	-1.72	2.56	-5.20	5.90	5.55%

Table 2 displays average decline in A1c, standard deviation, and 95% confidence intervals of final A1c values for the four study groups.

Table 3: *Comparison of Costs due to Unplanned Healthcare Claims*

	Study Group	Control Group
Sample Size	156	147
Number of Unplanned Claims	8	28
Total Charges	$111,034	$355,722
Mean Cost/Group Member	$712	$2,419
Mean Cost/Claim	$13,879	$12,704

Table 3 describes unplanned diabetes-related hospitalizations.

Results showed that, on a per-beneficiary basis, there was a reduction of $1,541 in charges over the course of the study period. These improved outcomes and lower costs are interpreted as the result of increased patient adherence to more tailored treatment regimens. The results of this study are consistent with other research literature that shows that the inclusion of pharmacists plays a key role in team-based care for improvement in diabetes outcomes. The study authors also surveyed providers to find out if there were any barriers to adoption of the CDS tool. The surveys showed that, for the most part, providers liked the CDS tool – but because it was not incorporated into the electronic health record they were already using, it lead to a disruption in workflow and added time.

Conclusions & Health Policy Implications for Medicaid

This project investigated whether team-based care, combined with a CDS point-of-care decision support tool, could lead to improved health outcomes, lower costs, and increased patient adherence in managing diabetes. Results reported statistically significant improvements in patient A1c measures and reductions in associated medical costs. Solutions to the challenges of poor patient adherence and clinical inertia may be successfully addressed through a combination of incorporating a CDS tool at the point-of-care with team-based approaches to engagement. Both pharmacists and physicians reacted positively to study protocol in constructing their patients' diabetes treatment regimens during this study. The main barrier to adoption noted by providers was that the CDS was time consuming; as it wasn't already integrated into their electronic health record software. This study shows promising results in improving clinical outcomes and lowering costs; and could be a solution towards improved management of uncontrolled diabetes for Medicaid beneficiaries.

References

[1]Kiel, P. J., & McCord, A. D. (2005). Pharmacist Impact on Clinical Outcomes in a Diabetes Disease Management Program via Collaborative Practice. *Annals of Pharmacotherapy*, *39*(11), 1828-1832.

[2]Jeffery, R., Iserman, E., Haynes, R. B., & CDSS Systematic Review Team. (2013). Can Computerized Clinical Decision Support Systems Improve Diabetes Management? A Systematic Review and Meta-Analysis. *Diabetic Medicine*, *30*(6), 739-745.

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