Clinical and Economic Impact of an Integrated Care Team Model on Targeted, High-Risk Medicare Patients With Type 2 Diabetes

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■ IN BRIEF "Quality Improvement Success Stories" are published by the American Diabetes Association in collaboration with the American College of Physicians, Inc., (ACP) and the National Diabetes Education Program. This series is intended to highlight best practices and strategies from programs and clinics that have successfully improved the quality of care for people with diabetes or related conditions. Each article in the series is reviewed and follows a standard format developed by the editors of *Clinical Diabetes*. The following article describes a referral-based program for managing high-risk patients with type 2 diabetes in California.

Describe your practice setting and location.

The Kaweah Delta Chronic Disease Management Center is a hospital-based specialty clinic, which is located in Tulare County in the Central Valley of California and serves a significantly rural and Hispanic population. Tulare County has the highest prevalence of type 2 diabetes in the state at 13.2%, which is nearly twice the statewide average of 6.9% (1). Patients targeted for this service are part of a fully capitated Medicare Advantage population cared for by an integrated delivery network (IDN) composed of a district hospital (Kaweah Delta Health Care District), medical group (Key Medical Group), and national health plan (Supplementary Figure S1).

Describe the specific quality gap addressed through the initiative.

This referral-based program was created by the hospital in conjunction with the medical group to identify and manage high-risk patients with type 2 diabetes. Patients are identified and enrolled into the program after a referral is secured from their primary care provider (PCP). The primary focus of this program is to reduce the percentage of patients with diabetes with an A1C >8.0%. Secondary foci are to decrease utilization of emergency department visits and hospitalizations, improve the accuracy of each patient's Medicare Risk Adjustment Factor (RAF) (2), decrease pharmacy costs, and improve quality scores by closing gaps in care. After enrolled patients reach program goals, they are graduated from the program and discharged back to their PCP. Program goals include enabling patients to meet a predefined A1C goal set by the care team, providing patient education throughout the program, and ensuring a safe transition to any new medication regimen.

How did you identify this quality gap? In other words, where did you get your baseline data?

Combined claim, laboratory, and medical records data owned by the IDN were leveraged to identify patients with type 2 diabetes and an A1C >8.0%. On review of the 7,196 IDN-served Medicare Advantage pa-

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tients, it was discovered that 2,408 (33%) of the total population had a diagnosis of type 2 diabetes, with 338 (14%) having an A1C >8.0% and 668 (28%) having no discoverable A1C on record (Supplementary Figure S2).

Referrals are requested from PCPs on a rolling basis. Data are presented here from the first 21 graduates. These graduates are from an initial pool of 49 patients referred to the program by PCPs located in two office locations with close ties to the hospital. PCPs have full discretion regarding which patients to refer to the program, and patients are able to decline the service. PCPs are given a list of patients who have a documented A1C >8.0%, indicating that they likely are not at an A1C goal appropriate for a Medicare-age population, as well as a pre-populated referral form requiring only PCP signature for each of these patients.

Summarize the initial data for your practice (before the improvement initiative).

The average baseline A1C for the first 21 graduates of the program was 9.75%, and 62% (*n* = 13) had an A1C >9.0%, indicating that these patients' data were negatively affecting the facility's Healthcare Effectiveness Data and Information Set (HEDIS) metrics (3). The rates of these 21 patients meeting HEDIS metrics for being treated with statins, aspirin, and ACE inhibitors/angiotensin receptor blockers (ARBs) were 71% (*n* = 15), 52% (*n* = 11), and 86% (*n* = 18), respectively. Sixty-seven percent (*n* = 14) were found to have gaps in diabetes standards of care, 43% (*n* = 9) were in need of an influenza or pneumonia vaccination, and 62% (*n* = 13) did not have a documented eye exam in the past year.

Before program enrollment, the average annualized drug expenditure for each patient was $7,221. Based on this drug expenditure, these patients reached the Medicare Part D (4) coverage gap (5) on average 9.9 months into the year, after which they were

responsible for 40 and 49% of brand-name and generic medication costs, respectively. Thirty-eight percent (*n* = 8) of these patients would hit the coverage gap.

The average RAF attributed to these patients was 0.89, indicating that CMS regarded these patients as healthier than an average Medicare beneficiary. RAF ratings dictate the amount of funding the IDN received from Medicare for the care of these patients. However, the average RAF was falsely low as a result of incomplete coding and assessment of hierarchical chronic conditions (6).

Before program enrollment, the average score was 3.4 for a perception of own health survey, which is distributed in the form of a Likert scale with scores ranging from 1 (poor) through 5 (excellent). The average score was 5.8 for activities of daily living (ADL), and 7.9 for instrumental activities of daily living (IADL). The Katz Independence in Activities of Daily Living (7) and the Lawton Instrumental Activities of Daily Living (8,9) surveys are used to assess ADL and IADL, respectively. In the former, patients are scored for independence in six functions (ability to bathe, dress, use the toilet, transfer, remain continent, and feed her/himself). A score of 6 indicates full function, 4 indicates moderate impairment, and ≤2 indicates severe functional impairment. The Lawton scale assesses a person's ability to perform tasks such as using a telephone, doing laundry, and handling finances, with scores ranging from 0 (low function, dependent) to 8 (high function, independent).

What was the timeframe from initiation of your quality improvement (QI) initiative to its completion?

The IDN was initially created to serve this Medicare Advantage plan in 2015. Leadership within the medical group and the hospital began planning for the Chronic Disease Management Center (CDMC), a lo-

cation to care for patients with high-risk, uncontrolled disease states, in 2015. The program launched in August 2016, seeing its first patient on 7 September 2016 and graduating its first member on 14 October 2016. This is an ongoing clinical service line that continues to grow in enrollment.

Describe your core QI team. Who served as project leader, and why was this person selected? Who else served on the team?

The core team is led by the CDMC medical director, an internal medicine physician with strong ties to the community who assisted in the development of the service and promotion of the service among community PCPs. The CDMC director and nurse manager helped develop and implement the program and maintain support from hospital and medical group leadership. A multidisciplinary team of medical providers consisting of nurse practitioners, clinical pharmacists, nurses, dietitians, and certified diabetes educators implements the plan of care for patients. Community outreach specialists (COS) help identify and address barriers to care, including social and economic barriers. Medical assistants and front office staff help to facilitate safe and effective coordination of the program.

Describe the *structural* changes you made to your practice through this initiative.

Patients with an A1C >8% are identified and eligible for the diabetes program. Patients are enrolled into the program by referral from their PCP. Once referred, the COS conducts an initial home visit to provide a standardized patient binder, which is brought to each medical appointment. The binder was developed to assist patients with organizing and consolidating their care plans, medication lists, blood glucose logs, laboratory orders, education materials, and medical appointments. The COS also assesses patients for any potential barriers to successful completion of

the program, including but not limited to lack of transportation, social issues, and financial limitations.

Initial clinic visits are scheduled as co-visits with the physician and the clinical pharmacist to create an initial care plan. Subsequent visits are scheduled, alternating between the clinical pharmacist and the nurse practitioner, with the goal of implementing the care plan. These visits occur on a frequency of once weekly to once monthly, depending on the care plan. Referrals to the diabetes educators are made as needed.

Interdisciplinary case conference meetings are held every 2 weeks for the purpose of discussing patient cases, improving patient-specific care plans, and documenting these plans in a shared network for the care team to follow. Care plans are influenced by ADL/IADL scores, provider assessments, and patient goals. The interdisciplinary case conferences are facilitated by the internal medicine physician and nurse practitioner at the CDMC and attended by the CDMC team, which is composed of the clinical pharmacists, pharmacy technician, dietitian, registered nurse, licensed vocational nurse, medical assistant, and COS (Supplementary Figure S3).

Because this program was designed as a co-management program, CDMC providers take care to focus on the referred diagnosis but remain cognizant of all gaps in patients' care. Medications pertinent to glycemic control are prescribed and adjusted at the CDMC as indicated by current guidelines and best practices, with consideration to medication costs, insurance coverage, and patients' out-of-pocket costs. When medication use is potentially controversial, consultations are held with patients' PCP and/or specialists. The aim is to foster interdisciplinary care and communication.

In addition to providing medical care for glycemic control, CDMC providers adjust medication plans for aspirin, statins, ACE inhibitors/

ARBs, and diabetes-related peripheral neuropathy medications. All patients are screened for gaps in immunizations, aspirin therapy, and statin utilization, ACE inhibitor/ARB utilization for nephropathy, depression management, yearly retinopathy screens, and peripheral vascular disease. Patients are screened for neuropathy, infections, foot ulcers, and gastroparesis at every visit. Recommendations for closing gaps in care are made to patients' PCP when identified through chart review and patient interview.

To close diabetes-related gaps in care, medical equipment including a retina scanner and an ankle-brachial index test machine were purchased. Having this equipment ensures that patients have access to these diagnostic evaluations at the CDMC rather than requiring a specialist referral. Retina scan images are read via telecommunication by a contracted ophthalmologist. Patients unable to obtain a reading because of poor-quality images and those with preexisting eye conditions are referred back to their PCP for an ophthalmologist referral. Results for both diagnostic tests are received by the CDMC and forwarded to PCPs for management. Abnormal results are sent to PCPs with a standardized communication letter recommending appropriate follow-up.

Patients' plans of care, visit findings, medication changes, identified gaps in care, and case conference summaries are provided to their PCP on a regular basis via facsimile. When gaps in care are identified outside of the scope of the program, gaps-in-care letters are faxed to PCPs notifying them about these needs (Supplementary Appendix). PCPs can elect to have the CDMC manage pertinent medication changes as indicated in a gaps-in-care letter or address these gaps themselves. Throughout the duration of their time in the program, patients are required to maintain care with their PCP to remain enrolled. Patient

education materials are standardized both within the EHR and in a central location within the clinic.

Describe the most important changes you made to your *process* of care delivery.

Creating a program that aligns the clinical and financial interests of the IDN and key stake holders is important. This is achieved by utilizing a site (hospital-based clinic) outside of the primary care offices for co-management of diabetes with the aim of improving glycemic control, closing gaps in care, reducing complications, improving outcomes, and reducing costs of care. This program allows for a concentration of resource-intensive care to be provided to patients with the greatest need.

Because of the collaborative nature of the program, working closely with the medical group to obtain the support of the PCPs in the community is essential. Workflows are in place for ancillary staff to alert PCPs of care plan changes after each visit at the CDMC. Four months after program initiation, IDN leadership sent COS from the CDMC to attend meetings with the medical group in order to bridge the gap between the patients' medical care and social barriers.

The program is designed to use existing resources such as the hospital's diabetes education program, the plan-sponsored Silver Sneakers exercise program, and Empowerment for Better Living, a self-management program certified by Stanford University for patients with chronic conditions.

Summarize your final outcome data (at the end of the improvement initiative) and how it compared to your baseline data.

A total of 21 patients have met graduation requirements for the program (Table 1). The average time to graduation date for these patients was 184 days. Average A1C after participation for the first 21 graduates was 6.93%, and 100% ($n = 21$) had an A1C <8%. The rates of patients on appropriately

TABLE 1. Patient Demographics and Outcomes

Patient	Age (Years)	Sex	Race	Language	Medi-Cal	RAF Score		Days in Program	A1C (%)		Aspirin Use*		Statin Use*		ACE/ARB Use*	
						Pre	Post		Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	67	M	NHW	English	No	2.208	2.146	38	10	7.2	0	1	1	1	1	1
2	78	M	H	English	No	0.83	2.022	106	8	5.9	1	1	1	1	1	1
3	69	M	H	Spanish	No	0.387	0.584	141	9.3	7.2	0	1	1	1	1	1
4	71	F	NHW	English	No	0.452	0.657	151	8.4	7	1	1	0	1	1	1
5	82	F	H	English	Yes	0.865	1.21	126	10.9	7.6	1	1	1	1	1	1
6	69	F	H	English	No	0.595	0.691	163	9.4	6.7	1	1	1	1	1	1
7	69	F	H	Spanish	No	0.595	0.657	210	8.1	7.5	1	1	1	1	1	1
8	64	F	H	English	No	0.486	1.151	231	8.2	7.3	1	1	1	1	1	1
9	63	M	NHW	English	No	0.852	0.853	209	8.3	6.2	1	1	1	1	1	1
10	78	M	NHW	English	No	0.742	2.412	225	9.2	6.1	1	1	1	1	1	0
11	79	M	NHW	English	No	0.539	0.876	255	8.1	7.5	0	1	0	1	0	1
12	63	M	NHW	English	No	0.297	1.338	178	11.8	6.6	0	1	1	1	0	0
13	69	M	Oth	English	No	0.894	1.203	273	10.3	7.3	1	1	1	1	1	1
14	72	F	NHW	English	No	0.885	1.703	155	10.5	6.9	0	1	0	1	0	1
15	69	F	NHW	English	No	0.675	1.102	160	15.2	7.2	0	1	0	0	1	1
16	76	M	H	Spanish	No	0.34	0.539	163	11	6.5	0	1	1	1	1	1
17	76	M	NHW	English	No	1.281	1.647	196	9.6	7.5	0	1	1	1	1	1
18	69	M	NHW	English	No	0	1.807	157	11	5.7	0	0	0	1	1	1
19	66	M	NHW	English	No	3.884	3.874	190	9	7.4	0	1	0	1	1	1
20	59	M	H	English	Yes	1.399	1.06	192	9.7	6.8	1	1	1	1	1	1
21	71	M	H	Spanish	No	0.387	0.658	344	8.8	7.4	1	1	1	1	1	1
Average						0.89	1.34	184	9.75	6.93						
Total											11	20	15	20	18	19
Percentage											52	95	71	95	86	90

*1 = yes; 2 = no. F, female, H, Hispanic, M, male, Medi-Cal, California Medical Assistance Program (Medicaid); NHW, non-Hispanic white. Oth, other

prescribed statins, aspirin, and ACE inhibitors/ARBs are 95% (*n* = 20), 95% (*n* = 20), and 91% (*n* = 19), respectively (Table 2).

The 21 graduates had an overall decrease of $85,570 in annualized Part A expenditure when considering pre- and post-program Part A utilization. Additionally, after graduation from the program, the average annualized drug expenditure for each patient decreased from $4,126 to $2,357, resulting in a total of $37,158 in Medicare Part D savings, and 19% of patients (*n* = 4) would reach the Medicare Part D coverage gap. Part D savings combined with Part A savings results in a total of $122,728 annualized savings or $5,844 per program graduate. In addition, the average projected RAF increased 51.6% from 0.86 to 1.34 (Table 3).

Part A utilization was calculated using claims data. The cut-off time for pre- and post-program calculations was set as the program enrollment date for each patient. This provided on average 295.7 days (range 193–353 days) of Part A claims data for post-enrollment calculation based on most up-to-date claims. An equivalent amount of time was used for the calculation of each patient's pre-enrollment of Part A claims. More than 90% of the savings in Part A data came from three separate patients' hospitalizations before program enrollment, two of which were cardiac-related and the other due to pancreatitis. Because diabetes increases the risk of both of these negative outcomes, a strong case can be made for the program's effect on Part A utilization. Two factors limiting the Part A savings are that pre-program utilization data were incomplete for one patient who had recently joined the plan, and post-program utilization was elevated for one member diagnosed with cancer during the program.

Part D utilization was calculated by comparing the annualized cost of each patient's chronic medication regimen before and after program enrollment. Pharmacy claims data were compared with medication lists in the EHR to remove nonchronic medications such as antibiotics and one-time opioid prescriptions. Because of the high cost of medications and the limitation of the Part D benefit, many patients required redevelopment of their pharmacotherapy regimens. This included insulin conversions from analog products to discounted NPH and regular human insulin products available for $25 per vial from a retail chain store that are frequently used and purchased out of pocket to avoid affecting patients' annual drug benefit.

Recommendations were made to PCPs to vaccinate, with a 29% positive response rate for influenza (4 of 14 received a vaccine) and a 56% positive response rate for pneumococcal pneumonia (5 of 9 received a vaccine). Response rates were lower than ideal because some patients declined vaccination despite extensive education. Additionally, many of these patients started the program at the end of the flu season, thus decreasing patients' perceived need for influenza vaccine. One hundred percent of patients (13 of 13) identified as not receiving their annual eye exams did so by graduation, and 43% (*n* = 9) were screened for peripheral artery disease (PAD) resulting in one new diagnosis of PAD.

During the post-graduation community outreach interview, the average score of the perception of own health survey increased from 3.4 to 3.6. The initial cohort of patients was highly functional despite their comorbidities. Thus, as expected, scores remained relatively unchanged for ADL (from 5.8 to 5.9) and IADL (stable at 7.9 for both measurements).

What are your next steps?
The initial phase of this project demonstrated to IDN leadership and health plan stakeholders that the

TABLE 2. Clinical Outcomes of Graduates (n = 21)

	Pre-Enrollment	Post-Graduation
Average A1C (%)	9.75	6.93
A1C >9% (% of patients)	62	0
ACE inhibitor/ARB use (% of patients)	86	91
Statin use (% of patients)	71	95
Aspirin use (% of patients)	52	95

TABLE 3. Economic Outcomes of Graduates, All Dollar Amounts Annualized (n = 21)

	Pre-Enrollment	Post-Graduation	Savings
Part A utilization ($)	95,388	9,818	85,570
Part D utilization ($)	86,652	49,494	37,158
Total Part A + Part D savings ($)	—	—	122,728
Total Part A + Part D savings per patient ($)	—	—	5,844
Average RAF score	0.89	1.34	—
Patients hitting the Part D coverage gap (% of patients)	38	19	—

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program is proving to be effective in enabling high-risk patients with uncontrolled diabetes to improve their glycemic control, ensuring that other standards of care are met, meeting HEDIS metrics, and lowering overall health care costs to the plan and patients. The number of program graduates and patients currently enrolled in the program is only a small fraction of our population diagnosed with diabetes and having an A1C >8.0%. With the initial success of the pilot, we are sending referral requests to all PCPs in the network, with a total of 338 referral requests sent for patients in the target population. The IDN is also systematically contacting the remaining 668 patients who do not have a documented A1C to connect them to their PCPs for screening and possible enrollment in the program. Continued engagement with community physicians to expand the number of patients enrolled in the program is an ongoing effort.

The program uses many resources for which compensation is not provided in a typical fee-for-service environment, including clinical pharmacist visits, home visits by community outreach specialists, telephone follow-up sessions, and dedicated clinic time for team case conferences. Because of the initial success and the unpaid resources used for the program, IDN leadership is working on creating a case rate for reimbursement. This could create an opportunity for partnership with other payers while circumventing the need to emphasize Medicare-recognized provider visits.

Finally, the clinic plans to introduce a similar program for other high-risk and high-cost disease states that affect the IDN. A program has been developed for chronic obstructive pulmonary disease, and referrals have been received from PCPs for identified patients.

What lessons did you learn through your QI process that you would like to share with others?

To improve outcomes while reducing costs for high-risk patients, a highly integrated, resource-intensive service line is needed that works in close collaboration with PCPs. It is vital to provide clinical management, self-management support, and close follow-up, with patients placed at the center of care. This effort increases patients' knowledge, skills, and confidence in managing their health condition.

A multidisciplinary team is required, through which all team members contribute their own expertise while sharing a common goal and plan for each patient. The bi-monthly case conference utilized by our team is vital to develop and execute our patients' plans of care. The structure of the team should be one in which no hierarchies are established, and the value of each team member is openly recognized.

A holistic approach is fundamental to this program's success. The care team must take into account not only the medical management of the disease state and its comorbidities, but also the patients' financial resources, social environment, education, cultural ideas, and preferences. Such an approach helps to engage patients and create an environment of trust and respect. Informed patients are motivated patients, ready to take actions toward their own care.

Not all patients require such an intensive approach, but for those with poor health literacy, chronically uncontrolled diabetes, social and behavioral issues, multiple complications, and gaps in care, such an approach is essential. Expecting PCPs to assess and address all of these aspects during regular office visits is unrealistic and leads to frustration and disengagement of patients and providers alike. In such cases, the role of a multidisciplinary team becomes essential.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.

References

1. California Department of Public Health. Burden of diabetes in California. Available from https://archive.cdph.ca.gov/programs/cdcb/Documents/FINAL%20Rpt%20(1877)%20DM%20burden%202014_9-04-14MNR3.pdf. Accessed 1 June 2017

2. Centers for Medicare & Medicaid Services. HHS-operated risk adjustment methodology meeting: discussion paper. Available from https://www.cms.gov/CCIIO/Resources/Forms-Reports-and-Other-resources/Downloads/RA-March-31-White-Paper-032416.pdf. Accessed 21 May 2017

3. Centers for Medicare & Medicaid Services. 2017 quality rating system measure technical specifications. Available from https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityInitiativesGenInfo/Downloads/2017_QRS-Measure_Technical_Specifications.pdf. Accessed 23 April 2017

4. Centers for Medicare & Medicaid Services. Drug coverage (Part D). Available from https://www.medicare.gov/part-d/index.html. Accessed 21 May 2017

5. Centers for Medicare & Medicaid Services. Costs in the coverage gap. Available from https://www.medicare.gov/part-d/costs/coverage-gap/part-d-coverage-gap.html. Accessed 21 May 2017

6. Centers for Medicare & Medicaid Services. 2017 risk adjustment fact sheet. Available from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeedbackProgram/Downloads/2015-RiskAdj-FactSheet.pdf. Accessed 20 November 2017

7. Katz S, Down TD, Cash HR, Grotz RC. Progress in the development of the index of ADL. Gerontologist 1970;10:20–30

8. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist 1969;9:179–186

9. Lawton MP, Moss M, Fulcomer M, Kleban MH. Multi-level assessment instrument manual for full-length MAI. North Wales Pa., Polisher Research Institute, Madlyn and Leonard Abramson Center for Jewish Life. 2003