

Abstract

The growing population of older adults with diabetes residing in long-term care (LTC) communities is an especially vulnerable subset of patients. Disease management is complicated by substantial numbers of transitions between care settings, care provision from multiple providers, and cognitive limitations. We report the results of a quality improvement initiative focused on improving the care of residents in two LTC communities.

Methods

We evaluated the baseline state of diabetes care in two large Brookdale Senior Living LTC communities in Florida, using both qualitative (focus group interviews) and quantitative (chart review) assessments of care provider knowledge, practice patterns, and resident health. We evaluated a total of 25 measures as demonstrated in Table 1. Evaluation of the data from the chart review and focus-group interviews informed the development of a live CE/CME-certified seminar provided to nursing assistants, nurses, physicians, and healthcare managers at the two study communities. Changes in care provider performance and resident health were assessed at 3 and 5 months post-education through chart review. We compared all categorical data, including categorized versions of clinical indicators, using chi-square tests. For clinical indicators that had a continuous variable response, we calculated the means and compared them with independent *t* tests.

Table 1. Chart Review Measures

General Health	Macrovascular Complications	Microvascular Complications	Glycemic Control
Process measures	Process measures	Process measures	Process measures
Documentation of physical activity	Action for suboptimal BP control	Evaluation of urine albumin excretion	Evaluation of HbA1C
Documentation of nutrition plan	Measurement of LDL	Comprehensive foot evaluation	Use of antihyperglycemics
	Measurement of triglycerides	Referral to specialty foot care	Use of sliding scale insulin
	Action for suboptimal lipid levels	Referral for dilated eye evaluation	Action to correct hypoglycemia
	Use of statin therapy		
	Use of fibrate therapy		
Patient health measures	Patient health measures	Patient health measures	Patient health measures
Weight	Blood pressure	Last eGFR	Daily blood glucose values
Smoking status	LDL		HbA1C
			Hypoglycemic events

Results

Thirty-two healthcare providers participated in the focus-group interviews; ; highlights of findings from these sessions include a need for general diabetes education, specific education about the management of complications in the elderly, better knowledge of antihyperglycemic agents, and an increased ability to recognize hypoglycemic events. Chart reviews were conducted at three intervals during the study, involving 35, 40, and 27 patients with diabetes at each review, respectively. Patient demographics were similar at each review period, with the exception of 20% decrease in long-stay (> 60 days) residents at the second review.

A total of 83 healthcare professionals participated in three 2-hour, live CE/CME-certified educational activities. Chart-review data following the education show improvements in four process measures, all related to the management of diabetes-related complications and four measures of patient health (Table 2). Daily blood glucose levels were both lower and less variable in the post-education period (Figure 1). Figure 2 shows observed changes in the percentage of patients with no evidence of hypoglycemic events which showed statistical significance between baseline and 3-months post-education (*P* < 0.05).

Table 2. Changes in Process and Patient Outcomes Measures

	Percent of Residents			
	Baseline (N = 35)	Time 1 (N = 40)	Time 2 (N = 27)	
Changes in Process				
Comprehensive Care	Documented physical activity	81	90	88
	Comprehensive foot evaluations	43	60	56
	Referrals for specialty care for abnormal foot evaluation	50	92	80
	Eye exams within past 12 months	46	66	55
Glycemic Control	HbA1C recorded at least once in past year	66	50	67
	Orders for SSI	54	65	52
Changes in Patient Outcomes				
Comprehensive Care	Last recorded LDL (g/dL)	93	87	83
	Last recorded HbA1C	6.5%	6.5%	6.5%
Glycemic Control	HbA1C range	5.1% - 12.2%	5.4% - 10.4%	5.4% - 9.9%
	Patients with no hypoglycemic events (%)	69	88	89

Figure 1: Changes in Daily Blood Glucose Levels

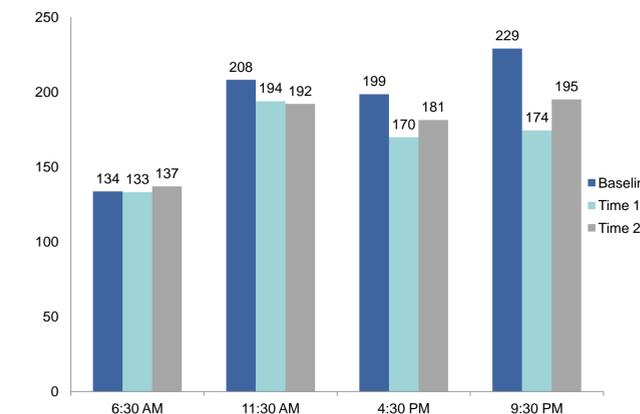
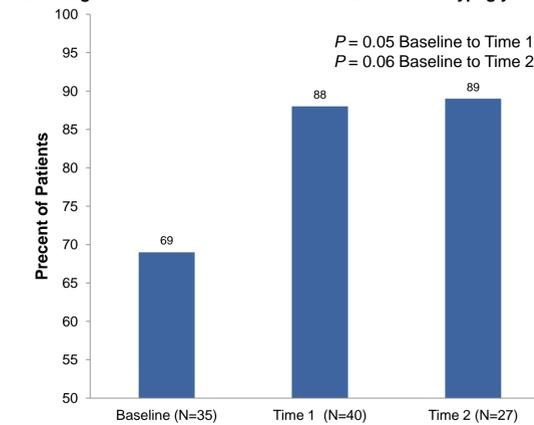


Figure 2: Changes in Percent of Patients with No Evidence of Hypoglycemia



Discussion

The provision of evidence-based care for elderly patients with diabetes requires a team-based approach. Several specialty societies have developed guidelines for diabetes management in older adults and for adults living in LTC settings, one including a specific recommendation for quality improvement programs to evaluate and improve contemporary care.¹⁻⁵ Our data illustrate the success of one such initiative for both comprehensive management and glycemic control. Reductions in LDL values represents a substantial improvement in the largest risk factor for cardiac events, while the improved processes for foot and eye exams suggest important steps toward the minimization of microvascular complications. Decreased spreads of HbA1C ranges, improved daily blood glucose measurements with reduced variability, and decreased hypoglycemic events suggest superior glycemic control at study end. The reduction of hypoglycemia is particularly exciting because untreated hypoglycemia in older patients may contribute to cognitive decline, falls, or permanent neurologic impairment.³ We believe that these findings convey an important signal regarding the potential for quality improvement projects such as ours to improve not only clinical processes, but also patient outcomes in an especially vulnerable population of persons with diabetes.

References

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