

Health Care Transition in Patients With Type 1 Diabetes

Young adult experiences and relationship to glycemic control

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OBJECTIVE—To examine characteristics of the transition from pediatric to adult care in emerging adults with type 1 diabetes and evaluate associations between transition characteristics and glycemic control.

RESEARCH DESIGN AND METHODS—We developed and mailed a survey to evaluate the transition process in emerging adults with type 1 diabetes, aged 22 to 30 years, receiving adult diabetes care at a single center. Current A1C data were obtained from the medical record.

RESULTS—The response rate was 53% (258 of 484 eligible). The mean transition age was 19.5 ± 2.9 years, and 34% reported a gap >6 months in establishing adult care. Common reasons for transition included feeling too old (44%), pediatric provider suggestion (41%), and college (33%). Less than half received an adult provider recommendation and $<15\%$ reported having a transition preparation visit or receiving written transition materials. The most recent A1C was $8.1 \pm 1.3\%$. Respondents who felt mostly/completely prepared for transition had lower likelihood of a gap >6 months between pediatric and adult care (adjusted odds ratio 0.47 [95% CI 0.25–0.88]). In multivariate analysis, pretransition A1C ($\beta = 0.49$, $P < 0.0001$), current age ($\beta = -0.07$, $P = 0.03$), and education ($\beta = -0.55$, $P = 0.01$) significantly influenced current posttransition A1C. There was no independent association of transition preparation with posttransition A1C ($\beta = -0.17$, $P = 0.28$).

CONCLUSIONS—Contemporary transition practices may help prevent gaps between pediatric and adult care but do not appear to promote improvements in A1C. More robust preparation strategies and handoffs between pediatric and adult care should be evaluated.

Diabetes Care 35:1716–1722, 2012

The developmental stage from the late teens through the twenties has been defined as emerging adulthood, a period typified by competing educational, social, and economic priorities (1). This period presents special challenges for patients with type 1 diabetes, a chronic illness that requires continuing medical follow-up and ongoing intensive self-management (2). Prior studies highlight the risk of gaps in medical follow-up and adverse

diabetes-related outcomes in emerging adults, including poor glycemic control, appearance of long-term diabetes complications, and early mortality (3–7). Patients in this vulnerable population have unique needs that often do not fit into the typical agendas of pediatric or adult diabetes care, and the transition from pediatric to adult health care settings can be problematic (8).

The health care transition process has been defined as “the planned, purposeful

movement of young adults from child-centered to adult-oriented health-care systems” (9). The American Academy of Pediatrics, the American Academy of Family Physicians, and the American College of Physicians recently published consensus guidelines calling for health care transition as a basic standard of high-quality medical care (10). For patients with type 1 diabetes, studies in Canada and Europe highlight difficulties in the transition process, including significant delays in care (11), increased posttransition diabetes-related hospitalizations (12–15), and general patient dissatisfaction with the transition experience (12–15).

The American Diabetes Association recently published clinical practice guidelines on health care transition for emerging adults with diabetes (16), based on expert consensus. However, empiric data are extremely limited on posttransition outcomes and best practices in transition care, and there are virtually no data from the U.S. (17,18). Very little is known about the role of specific aspects of transition preparation or the relationships between the transition process and diabetes outcomes, such as glycemic control.

In this study, we sought 1) to describe the health care transition in a large group of emerging adults with type 1 diabetes currently receiving adult care, including both biomedical (e.g., hemoglobin A1C) and health care delivery characteristics; and 2) to investigate associations between these health care transition characteristics and past and present glycemic control. A priori, we identified three measures of “unsuccessful transition”: inadequate preparation (i.e., lack of receipt of recommended transition elements) by patient self-report, prolonged gap between pediatric and adult care, and patient dissatisfaction with the transition process. We hypothesized that emerging adults reporting strong transition preparation would be less likely to have a prolonged gap between pediatric and adult diabetes care. Furthermore, we hypothesized that emerging adults who had a successful health care transition would be more likely to have an optimal hemoglobin A1C after the transition period.

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Received 14 December 2011 and accepted 25 March 2012.

DOI: 10.2337/dc11-2434

This article contains Supplementary Data online at <http://care.diabetesjournals.org/lookup/suppl/doi:10.2337/dc11-2434/-/DC1>.

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RESEARCH DESIGN AND METHODS

Survey development

We developed a structured survey to characterize the transition experiences of emerging adults with type 1 diabetes. A search of the academic literature on health care transitions in diabetes and other chronic illnesses, as well as a Google search for Internet resources on health care transition, initially guided the content areas. These steps were supplemented by qualitative data from three focus groups of emerging adults with type 1 diabetes ($n = 16$, mean age 26.6 ± 2.5 years, 56% female, 81% Caucasian, mean A1C 7.5%). Several clinicians and researchers with expertise in pediatric and adult diabetes care and health care transition reviewed the original survey instrument and provided input on content validity. The survey was revised and administered to a convenience sample of six emerging adults for cognitive testing.

The survey included 85 items divided into six sections: 1) medical history (age at diabetes diagnosis, comorbid conditions, and diabetes complications); 2) pediatric diabetes care (location, providers, and visits in the year before transition) and pediatric glycemic control; 3) characteristics of health care transition, including age at transition, reasons for transition, preparation for transition, satisfaction with the transition process, and gap between pediatric and adult diabetes care; 4) attributes of current adult diabetes care; 5) current diabetes self-care behaviors and social support; and 6) demographic characteristics. A secure electronic version was created using REDCap Survey (Research Data Electronic Capture, hosted by the Joslin Diabetes Center in conjunction with user support from Harvard Catalyst) (19). This study was approved by the committee on human studies at the Joslin Diabetes Center.

Survey administration

Eligible subjects included emerging adults with type 1 diabetes, aged 22 to 30 years, who were under the care of any adult diabetes specialist at the Joslin Diabetes Center. Electronic medical record review identified patients with the following criteria: encounters with ICD-9 codes 250.X1 or 250.X3, diabetes diagnosis before age 18 years, previous pediatric diabetes care, and a medical visit with hemoglobin A1C measured in the adult clinic within 2 years of the study.

We mailed a paper survey to all eligible subjects in three waves between January and March 2011. The first mailing included a small gift (Post-it notes), and respondents were entered into a raffle to win an Apple iPad 2. Within 1 week of the first mail wave, subjects with an available e-mail address were sent an electronic version of the survey. After the third wave, study staff called those who had not yet responded (58% of sample) to encourage paper or electronic survey completion. For purposes of comparison, administrative data were collected from the medical record for survey nonrespondents when available, including current age, age at diabetes diagnosis, sex, race, type of insurance, and most recent A1C.

Variables related to health care transition

To assess transition preparation, the survey asked yes/no questions about receipt of eight key preparation elements, as listed in Supplementary Table 1. In addition, the survey included a summary preparation question: "To what extent did you feel prepared or unprepared to leave your child/adolescent diabetes providers," with five response options: completely unprepared, mostly unprepared, neutral, mostly prepared, and completely prepared.

The survey also contained a summary question about transition satisfaction, with five response options: completely dissatisfied, mostly dissatisfied, neutral, mostly satisfied, and completely satisfied. The summary preparation and satisfaction questions were analyzed as dichotomous variables (combining "mostly" and "completely") to distinguish subjects reporting positive transition experiences.

The survey also assessed self-reported time gap between last pediatric diabetes appointment and first adult diabetes appointment with five response options: ≤ 3 months, 4–6 months, 7–12 months, 13–24 months, or >24 months. The American Diabetes Association (2) recommends diabetes visits at least every 6 months for individuals aged >18 years treated with insulin. Furthermore, we elected to dichotomize the gap variable at ≤ 6 months or >6 months so that our work would be directly comparable with earlier publications describing posttransition gaps in care >6 months for patients with type 1 diabetes (12,13).

Glycemic control

The primary study outcome was the most recent measured hemoglobin A1C (Tosoh

analyzer; Tosoh Medics, Inc., Foster City, CA) in the adult clinic before the first survey mailing. In addition, as a measure of pretransition glycemic control, the survey asked for a self-report of A1C in the last year of pediatric care, with seven response categories: ≤ 7.0 , 7.1–8.0, 8.1–9.0, 9.1–10.0, 10.1–12, $>12\%$, or don't know. There were 24 respondents who responded "don't know" to the pretransition A1C query; these were eliminated from all bivariate and multivariate analyses. The other six categories were analyzed as a continuous variable using the mean for each range and an imputed value of 13% for the $>12\%$ option.

To validate the self-reported pretransition A1C variable, we identified 69 respondents who had received their pediatric diabetes care at Joslin Diabetes Center. Self-reported pretransition A1C values agreed with measured pretransition A1C values in 72% (50 of 69) of these respondents; of the 28% (19 of 69) that did not agree, two-thirds of self-reported values were higher than the measured values and one-third were lower.

Statistical analysis

All statistical analyses were conducted using SAS version 9.2 (SAS Institute, Inc., Cary, NC). The threshold for statistical significance was set at an α -level of 0.05 (two-tailed). Descriptive statistics were presented as means and SDs or proportions. Bivariate regression analyses were used to screen variables for multivariate regression models. In the multivariate models, we included sociodemographic characteristics and clinically relevant variables, as well as those variables significant in bivariate analyses.

We used χ^2 tests to evaluate associations between individual transition preparation survey items and overall transition preparation and multivariate logistic regression to examine patient-related factors associated with overall preparedness.

Multivariate logistic regression analysis provided the odds of a prolonged gap >6 months between pediatric and adult care, in the presence of transition variables. We then estimated the predicted probability of a gap for clinically important combinations of four variables (sex, transition preparation, number of pretransition diabetes visits, and level of education).

We examined predictors of the most recent adult clinic A1C using multivariate linear regression. In addition, to address potential recall bias, we conducted a subgroup analysis for those participants who

had transitioned to adult diabetes care within 3 years of the study.

RESULTS—Of surveys mailed to 512 patients, 12 were returned undeliverable, and 16 subjects reported that they were ineligible (e.g., miscoded as having type 1 diabetes in the record or never treated by a pediatric diabetes provider). A total of 258 completed surveys were returned (189 paper and 69 electronic) from 484 eligible participants. Prior to reminder phone calls, we received 204 surveys (181 paper and 23 electronic), and after the calls, we received an additional 54 surveys (8 paper and 46 electronic). The overall response rate was 53%.

Sample characteristics

Table 1 displays respondent characteristics. The majority of respondents (mean age 26.7 ± 2.4 years) were female (62%), Caucasian (92%), college educated or higher (82%), and employed full-time (70%) and had private insurance (90%) (Table 1). A total of 44% lived with a spouse or partner, 15% lived with their parents, and 14% lived alone. The mean age at diagnosis of type 1 diabetes was 9.9 ± 4.8 years, with mean diabetes duration was 16.7 ± 5.5 years.

In the year before transition, 16% of respondents reported a pretransition A1C $\leq 7.0\%$, while 17% reported a pretransition A1C $>9\%$. The mean of the most recent measured adult clinic A1C before survey fielding was $8.1 \pm 1.3\%$. With respect to psychiatric comorbidities, 13% reported a current diagnosis of depression and 17% reported anxiety. Regarding diabetes complications, 10% reported diabetic retinopathy, 17% reported hypercholesterolemia, and 15% reported hypertension.

Pediatric care location

In the 12 months before transition, 31% of respondents received pediatric diabetes care at Joslin Diabetes Center and 13% received pediatric diabetes care at Children’s Hospital Boston. The remaining 140 respondents (56%) received pediatric diabetes care at 93 different endocrinology clinics, diabetes centers, and private practices in the U.S. Respondents who received pediatric care at either of the 2 Boston institutions were not significantly different from those who received pediatric care elsewhere in the frequency of gap >6 months between pediatric and adult care (30 vs. 39%, $P = 0.15$), transition preparation (mostly/completely prepared 64 vs. 62%, $P = 0.63$), transition satisfaction (mostly/completely satisfied 60 vs. 64%, $P = 0.49$), or current A1C (8.1 ± 1.2 vs. $8.2 \pm 1.4\%$, $P = 0.61$).

Table 1—Respondent characteristics

Characteristic	Observation (n)	Mean \pm SD or %
Current age (years)	255	26.7 ± 2.4
Female	255	62
Caucasian	258	92
Age at diabetes diagnosis (years)	253	9.9 ± 4.8
A1C in year before transition (%)	252	
≤ 7.0		16
7.1–8.0		37
8.1–9.0		21
9.1–10.0		11
10.1–12.0		5
>12		1
Don’t know		9
Age at transition to adult diabetes care (years)	252	19.5 ± 2.9
Most recent A1C (measured) (%)	258	8.1 ± 1.3
Gap between last pediatric diabetes visit and first adult visit (months)	250	
≤ 3		18
4–6		48
7–12		22
13–24		8
>24		4
Living arrangements†	258	
With spouse/partner		44
With parents		15
With own child/children		10
With other family members		8
With roommate(s)		26
Alone		14
Current level of education	258	
High school or equivalent		4
Some college		14
4-year college degree		43
Some graduate school		13
Graduate degree		26
Vocational training		2
Current occupation	254	
Full-time paid employment		70
Part-time paid employment		11
Student		13
Unemployed		5
Homemaker		1
Insurance status	258	
Private insurance		90
Medicaid		9
Uninsured		1
Comorbidities	258	
Diabetic retinopathy		10
Hypercholesterolemia		17
Hypertension		15
Depression		13
Anxiety		17

†Percentages add up to >100 because subjects were asked to check all that apply. None of the subjects reported living with a spouse/partner as well as a parent; these were used as mutually exclusive variables in analyses.

Survey nonrespondents

Survey nonrespondents ($n = 226$) were 45% female (vs. 62% for respondents, $P < 0.001$) with a mean age of 26.4 years

($P = 0.30$), a mean age at diabetes diagnosis of 9.8 years ($P = 0.84$), and a mean A1C of 8.6% (vs. 8.1% for respondents, $P < 0.0001$). Administrative race data, available

for 211 nonrespondents, identified 89% as Caucasian ($P = 0.31$). Of the 208 nonrespondents with available data on insurance, 79% had private insurance (vs. 91% for respondents, $P = 0.0005$).

Age at transition and reasons for transition

The mean age at transition to adult care was 19.5 ± 2.9 years. Respondents provided multiple reasons for transfer to adult diabetes care, including “feeling too old” for pediatrics (44%), pediatric provider suggestion (41%), starting college (33%), relocating to a new area (27%), parent suggestion (18%), and “not liking” the pediatric diabetes provider (17%). Respondents were also asked to indicate the “most important” reason for transition, and the top three selections were feeling too old for pediatrics (23%), pediatric provider suggestion (21%), and starting college (17%).

Transition preparation

Figure 1 shows the proportion of respondents who indicated receiving each of eight preparation items (Supplementary Table 1) deemed to be important for a successful transition (8,10,20,21). Only three items were endorsed by $>50\%$ of respondents (having a pediatric diabetes visit without a parent/guardian in the room, discussing recommended annual diabetes screening tests with the pediatric provider, and discussing independent diabetes self-management with the pediatric provider). Approximately half of respondents received specific adult provider or clinic recommendations. The other three transition preparation items (having a specific visit to discuss transition,

receiving written transition materials, or meeting the adult provider before transition) were endorsed by $<15\%$.

Overall, 4% of respondents felt completely unprepared for transition, 7% mostly unprepared, 26% neutral, 38% mostly prepared, and 25% completely prepared. Endorsement of seven out of eight individual preparation items was significantly associated with overall preparedness ($\chi^2 P < 0.01$ for all except having a pediatric visit without parent/guardian in the room, $P = 0.08$).

In a multivariate model analyzing factors associated with overall transition preparedness, males were significantly more likely to report being mostly/completely prepared (odds ratio [OR] 2.76 [95% CI 1.48–5.15]). Age at transition had a minor impact (1.14 [1.02–1.28]). The other variables in the model, including pretransition A1C (0.64 [0.36–1.15]), higher education (1.70 [0.79–3.68]), and pediatric visit number (1.05 [0.82–1.35]), were not significantly associated with transition preparation.

Transition satisfaction

When asked about overall transition satisfaction, 2% of respondents felt completely dissatisfied, 13% mostly dissatisfied, 23% neutral, 36% mostly satisfied, and 26% completely satisfied. Transition satisfaction (mostly/completely satisfied) and preparation (mostly/completely prepared) were very highly associated ($\chi^2 P < 0.0001$).

Gap between pediatric and adult diabetes care

Of respondents, 34% reported a gap >6 months between the last pediatric diabetes visit and first adult visit, and 12%

reported a gap >12 months. Table 2 shows factors associated with gaps >6 months. In the multivariate model (adjusted $R^2 = 0.14$, $P = 0.0009$), respondents who were mostly/completely prepared were significantly less likely to report a gap in care (OR 0.47 [95% CI 0.25–0.88]), as were those who had three or more pediatric diabetes visits in the year before transition (0.35 [0.19–0.63]). In this adjusted model, pretransition A1C was not significantly associated with a prolonged gap in care.

The highest predicted probability of a gap in care >6 months was 0.62, for females who felt neutral or unprepared for transition, did not have a college degree, and had less than three pediatric diabetes visits in the year before transition. The lowest predicted probability was 0.19 when these factors were reversed (i.e., males who felt mostly/completely prepared for transition, had college degrees, and had three or more pediatric diabetes visits in the year before transition).

Posttransition glycemic control

Table 3 shows factors associated with posttransition glycemic control. Since report of transition preparation was so closely related to both gaps in care and dissatisfaction with the transition experience, only preparation was included as a transition variable in models predicting glycemic control. In the multivariate model (adjusted $R^2 = 0.31$, $P < 0.0001$), average current A1C was 0.49% higher for each percent increase in pediatric pretransition A1C ($\beta = 0.49$, $P < 0.0001$). Higher education ($\beta = -0.55$, $P = 0.01$) and current age ($\beta = -0.07$, $P = 0.03$) were inversely

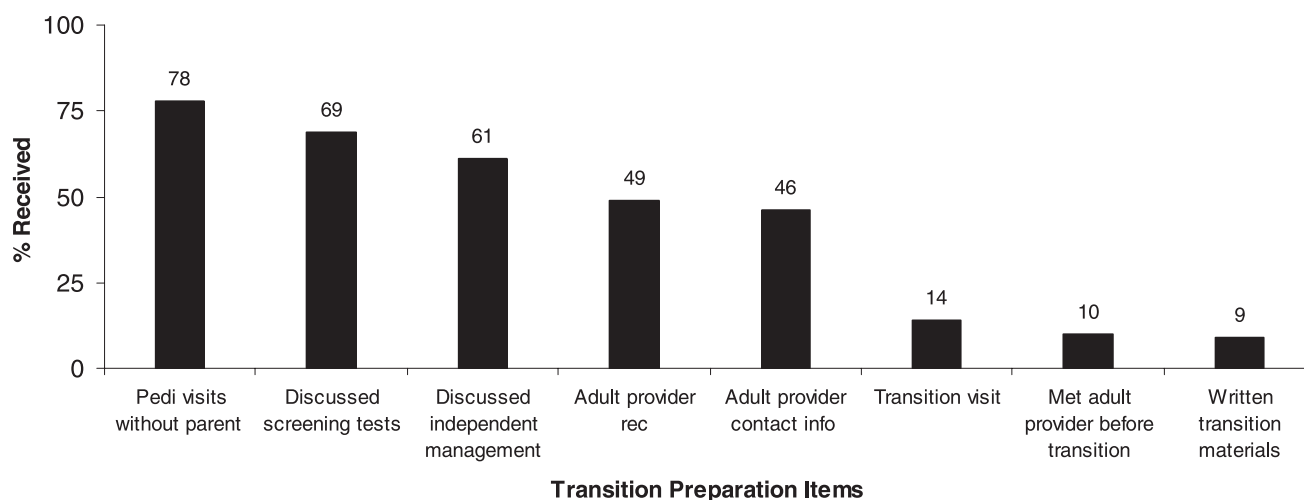


Figure 1—Bars represent proportions of respondents who reported receiving specific transition preparation items. *Pedi*, pediatric; *rec*, recommended; *info*, information.

Table 2—Factors associated with a prolonged gap >6 months between pediatric and adult care

Variable	Bivariate model (OR [95% CI])	Multivariate model (OR [95% CI])
Mostly/completely prepared for transition	0.44 (0.25–0.79)	0.47 (0.25–0.88)
Pediatric A1C in year before transition	1.24 (1.0–1.52)	1.18 (0.95–1.48)
Age at transition (continuous)	0.95 (0.85–1.05)	0.95 (0.86–1.06)
Education college or higher	0.81 (0.39–1.69)	1.08 (0.48–2.43)
Male	0.83 (0.47–1.47)	0.98 (0.53–1.82)
≥3 pediatric visits in year before transition	0.35 (0.20–0.61)	0.35 (0.19–0.63)

Number of subjects in model = 234; model $R^2 = 0.10$; model adjusted $R^2 = 0.14$; model $P = 0.0009$.

associated with posttransition A1C. There was no independent association of transition preparation with glycemic control ($\beta = -0.17$, $P = 0.28$). In addition, age at transition, sex, living situation, anxiety, depression, and Medicaid enrollment were not associated with posttransition A1C in this sample.

In a multivariate subgroup analysis (adjusted $R^2 = 0.41$, $P = 0.004$) for the 45 participants who had transitioned to adult care in the 3 years before the survey, the results were very similar. Pretransition A1C was associated with higher posttransition A1C ($\beta = 0.49$, $P = 0.002$), higher educational attainment was inversely associated with posttransition A1C ($\beta = -1.66$, $P < 0.04$), and transition preparation was not associated with posttransition A1C ($\beta = 0.36$, $P = 0.46$).

CONCLUSIONS—To our knowledge, this is the largest cross-sectional study to date describing health care transition experiences reported by emerging adults with type 1 diabetes and the first such study in the U.S. Our results highlight

several major challenges in health care transition for patients with type 1 diabetes. In our sample, only 63% reported having felt mostly or completely prepared to make the transition, and 62% reported being mostly or completely satisfied with the process. Less than half were given the name or contact information for an adult diabetes provider before transition, and <15% had access to specific transition visits or materials.

We found that 34% of participants reported a gap >6 months between pediatric and adult diabetes care, a finding consistent with prior studies (12,13,22) For example, Pacaud et al. (12,13) reported gaps >6 months between pediatric and adult diabetes care in 28% ($n = 135$) and 31% ($n = 81$) of emerging adults with type 1 diabetes in Quebec and Alberta, Canada. Patients with gaps in care may be at risk for further loss to follow-up and disconnection from adult care. Furthermore, previous research shows an increased incidence of acute and chronic diabetes complications in youth with infrequent clinic follow-up (6,23).

We also found that emerging adults with strong transition preparation and three or more pediatric diabetes visits in the year before transition were significantly less likely to report a gap >6 months between pediatric and adult care. The independent impact of pretransition visit frequency highlights the importance of establishing a habit of uninterrupted medical follow-up before transition. It is interesting that although our respondents represented a wide range for pretransition A1C, this variable was not associated with gaps in care.

Our study supports the need for interventions to decrease posttransition gaps in care. In Manitoba, Canada, Van Wallegghem et al. (24) showed decreased gaps in a pilot study of emerging adults who received support services from a transition coordinator. In Australia, Holmes-Walker et al. (23) also tested a program with a transition coordinator and demonstrated improved clinic attendance and reduction in admissions for diabetic ketoacidosis. In an analysis of the Ontario Diabetes Database, Nakhla et al. (11) showed that patients who remained with the same physician after transition were at lower risk for hospitalization.

Although transition preparation was associated with decreased gaps in care in our sample, it was not associated with improvements in posttransition A1C. In contrast, pretransition A1C and level of education were strong predictors of posttransition A1C. Typical transition preparation activities, like those assessed in our survey, may not be sufficient to support emerging adults to engage successfully in diabetes self-care behaviors aimed at optimizing glycemic control.

Other cross-sectional and observational studies also examined A1C values across the transition and found no significant differences between pre- and posttransition A1C values (14,15,17,25). However, two reports of specific transition coordination interventions, in Australia and Italy, reported improved A1C values after program implementation (23,26). The vast majority of our respondents did not have access to targeted transition interventions, which are likely required to improve A1C outcomes.

It is interesting that in our study, age at transition was not significantly associated with glycemic control, gaps in care, or transition preparation. The developmental stage and self-care proficiency of individual patients at the time of transition may be more relevant to outcomes than the chronologic age at transition.

Table 3—Factors associated with most recent young adult A1C

Variable	Bivariate model		Multivariate model	
	β (SE)	P value	β (SE)	P value
Mostly/completely prepared for transition	-0.43 (0.18)	0.02	-0.17 (0.16)	0.28
Pediatric A1C in year before transition	0.51 (0.06)	<0.0001	0.49 (0.06)	<0.0001
Age at transition	-0.031 (0.03)	0.19	-0.010 (0.03)	0.72
Current age	-0.06 (0.03)	0.08	-0.07 (0.03)	0.03
Education college or higher	-0.87 (0.21)	0.0002	-0.55 (0.21)	0.01
Male	-0.35 (0.18)	0.02	-0.14 (0.16)	0.37
Living with partner	-0.20 (0.18)	0.26	0.06 (0.21)	0.77
Living with parents	-0.22 (0.22)	0.38	-0.31 (0.24)	0.20
Living alone	0.03 (0.24)	0.90	0.09 (0.24)	0.71
Depression	0.70 (0.27)	0.01	0.026 (0.26)	0.92
Anxiety	0.57 (0.25)	0.02	0.18 (0.25)	0.47
Medicaid	0.75 (0.29)	0.02	0.16 (0.30)	0.59

β represents the percent change in young adult A1C. Number of subjects in model = 234; model $R^2 = 0.34$; model adjusted $R^2 = 0.31$; model $P < 0.0001$.

Several study limitations should be noted. The cross-sectional design precludes assertions of causality. The lack of impact of transition preparation on glycemic control may reflect limitations in the survey questions used to assess preparation, although we developed the questions based on literature, qualitative data from focus groups, and expert input. Patient perceptions of transition may be subject to recall bias, although we did not observe different results in our subgroup analysis of those respondents who had transitioned more recently. Our response rate of 53% compares favorably with other survey studies of emerging adults with diabetes (12,13,27), but the proportion of nonrespondents is nonetheless significant. Respondents and nonrespondents did not significantly differ in terms of current age, age at diabetes diagnosis, or race; however, more nonrespondents were male, had public insurance, and had higher current A1C levels. Additional studies are needed to understand the transition experience in patients with these characteristics.

Our respondent sample was, on average, a highly educated, relatively economically advantaged group of patients who have found their way to specialized adult diabetes care, which affects generalizability. We suspect that the deficiencies in the transition process identified in this study, including suboptimal preparation and gaps in care, would be magnified in other more diverse emerging adult populations.

In conclusion, further research is needed to determine the optimal approach to transition preparation, with a focus on defining preparation activities that are important determinants of young adult diabetes self-care success. Even before transition planning begins, given the strong predictive power of pretransition A1C, continued study of pediatric interventions to prevent deterioration in glycemic control during adolescence (28,29) is warranted. Finally, to help foster optimal A1C outcomes after transition, future work should examine interventions to improve handoffs between pediatric and adult diabetes providers and offer developmentally tailored care for emerging adults entering adult diabetes clinics.

Acknowledgments—K.C.G. was supported by the Agency for Healthcare Research and Quality (T32-HS000063) as part of the Harvard Pediatric Health Services Research Fellowship, as well as the National Institute of Diabetes and

Digestive and Kidney Diseases (T32DK007699-30) and the William Randolph Hearst Foundation. J.A.F. was funded by a grant from the National Institute of Child Health and Human Development (K24-HD-060786).

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

K.C.G. researched data, contributed to discussion, and wrote, reviewed, and edited the manuscript. H.A.W., L.M.L., and K.K. contributed to discussion and reviewed and edited the manuscript. E.T.R., J.I.W., and J.A.F. researched data, contributed to discussion, and reviewed and edited the manuscript. M.G.B. researched data and reviewed and edited the manuscript. K.C.G. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Parts of this study were presented in abstract form at the Pediatric Academic Societies Annual Meeting, Boston, Massachusetts, 28 April–1 May 2012.

The authors thank all of their young adult respondents for participating in this study.

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