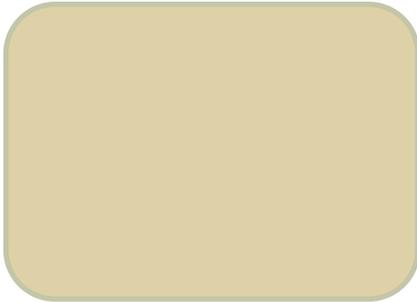


# Madison Area Technical College Patient Care Pathway Program: Implementation and Early Impact Report



## Pathways for Advancing Careers and Education

OPRE Report No. 2018-48



September 2018



**PACE**  
Pathways for Advancing  
Careers and Education

# Madison Area Technical College Patient Care Pathway Program: Implementation and Early Impact Report Pathways for Advancing Careers and Education (PACE)

OPRE Report No. 2018-48

September 2018

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## Overview

This report provides early evidence on the implementation and impacts of the Madison Area Technical College Patient Care Pathway program, which aimed to help low-skilled students in the Madison, Wisconsin, area access occupational training in the growing healthcare sector. The Patient Care Pathway program adapted and linked existing programs at the college to create three one-semester academies offering low-skilled students an accelerated pathway into their chosen healthcare program. It is one of nine programs embodying elements of the career pathways framework that are the subject of the Pathways for Advancing Careers and Education (PACE) evaluation. The Administration for Children and Families is sponsoring the evaluation.

The Patient Care Pathway program consists of three key elements:

- (1) a structured healthcare training pathway for students with low skill levels;
- (2) contextualized and accelerated basic skills instruction packaged with credit-bearing courses; and
- (3) proactive advising to help students to navigate the program admission process, develop an academic plan, and identify and address academic and non-academic barriers to program completion.

Using a rigorous research design, the study found that the Patient Care Pathway program did not increase number of college credits earned, the confirmatory outcome for the evaluation. The program increased the likelihood of enrollment in occupational training, but did not increase hours of occupational training received or the attainment of education credentials within an 18-month follow-up period. Future reports will examine educational credential attainment as well as employment and earnings outcomes.

## Primary Research Questions

- What intervention was actually implemented? Did it deviate from plans or expectations?
- What were students' participation patterns and experiences with program services?
- What were the effects of the Patient Care Pathway program on the number of college credits earned and other educational outcomes?

## Purpose

The federal government projects that over the next 10 years, the fastest growing occupations will be in healthcare. Almost all jobs in healthcare require some level of postsecondary education or training. But many low-income, low-skilled adults face barriers to completing even short-term training for entry-level jobs.

Programs embodying elements of the career pathways framework attempt to address one or more such barriers by providing well-defined training steps targeted to jobs in-demand locally, combined with a range of financial, academic, employment, and personal supports and services. To assess the effectiveness of a career pathways program such as the Patient Care Pathway, the PACE evaluation used an experimental design in which program applicants were assigned at random to a “treatment” group who could access the program or a “control” group who could not, then compared their outcomes.

## Key Findings and Highlights

- The Patient Care Pathway program staff implemented program components mostly as planned, including basic skills and occupational training and instructional approaches. However, the advising component – which encouraged, but did not mandate, three advising sessions during the semester – was less intensive than planned. Fewer than half of students reported receiving academic advising three or more times.
- Healthcare program admission policies external to the program presented barriers for admission to and timely completion of healthcare diploma and degree programs for Patient Care Pathway students. These policies included short annual application windows, lags of up to a year between application windows and program admission and start dates, and an added admissions assessment. Once admitted, program waitlists delayed students in enrolling in healthcare program core courses, slowing their progress toward diploma or degree completion.
- More than 90 percent of treatment group members participated in at least one Patient Care Pathway academy and completion rates were high. Although less than a quarter of treatment group members earned a credential within the 18-month follow-up period, more than 70 percent were still enrolled in courses at Madison College. This is consistent with program designers’ expectation that most students would not be able to complete an academy and a one- or two-year program within 18 months.
- The Patient Care Pathway program did not increase the number of college credits earned (the confirmatory outcome for this report), total hours of occupational training, or credential receipt during the 18-month follow-up period. The treatment group was 7 percentage points more likely than control group members to be enrolled in occupational training.

## Methods

The evaluation’s implementation study examined the design and operation of the program and the treatment group’s participation patterns. Its impact study estimated effects on the program’s education and training, and employment outcomes.

From December 2011 through January 2014, the evaluation randomly assigned 500 program applicants to either the treatment or the control group. The impact study used data from a follow-up survey at 18 months after random assignment and administrative records from Madison Area Technical College. The evaluation also included site visits to document program implementation and operations.

Prior to estimating Patient Care Pathway program impacts, the research team published an analysis plan that organized and disciplined the number of statistical tests conducted so as to avoid the problem of “multiple comparisons,” in which a potentially large number of the tests could reach conventional levels of statistical significance by chance. To address this issue, the team established three categories of hypotheses (confirmatory, secondary, and exploratory) and publicly registered confirmatory and secondary outcomes prior to starting analyses.

## Executive Summary

Over the next 10 years, the federal government projects that demand for workers in healthcare jobs will grow quickly as the population grows and ages.<sup>1</sup> Successfully meeting the need for more healthcare workers is important both to the national economy and to the quality of healthcare available to the population. This demand also creates opportunities for low-income adults' entry-level employment and advancement to higher-skilled jobs. Almost all jobs in healthcare require some level of training after high school. Policymakers, workforce development organizations, educators, and other key stakeholders are very interested in how to enable the match between the nation's need for a skilled workforce and low-income adults' need for employment.

### Patient Care Pathway Program

This report provides early evidence on the implementation and impacts of the **Patient Care Pathway** program, operated between 2011 and 2014 by **Madison Area Technical College** (hereafter referred to as Madison College), a community college in the Madison, Wisconsin, area. The program aimed to help low-skilled students access occupational training in the growing healthcare sector. Through the Patient Care Pathway program, Madison College combined occupational courses, contextualized basic skills courses, and advising into semester-long "academies." The goal was to promote persistence toward and completion of college-level healthcare diploma and degree programs.

The Patient Care Pathway program adapted and connected existing one-semester programs to create three Patient Care Pathway academies. The purpose of the academies was to give students with low test scores (ACT Compass™) an accelerated pathway into the healthcare training program of their choice. Patient Care Academy 1 (PCA1) targeted students interested in a one-year healthcare diploma; Patient Care Academy 2 (PCA2) targeted students interested in pursuing a two-year associate's degree in healthcare. PCA1 was also the starting point for students interested in a two-year degree program, but who did not have the required basic skills to be eligible for PCA2. After completing

#### Quick Evaluation Findings

- The program implemented most components as planned, with some modifications. The exception was the advising component, which was less intensive than planned.
- Healthcare program admission policies at Madison College created barriers for admission to and timely completion of diploma and degree programs.
- Over an 18-month follow-up period, compared with control group members, treatment group members (those with access to the Patient Care Pathway program):
  - did not earn more college credits;
  - did not earn more credentials;
  - were seven percentage points more likely to be enrolled in occupational training; and
  - did not participate in more hours of occupational training.

<sup>1</sup> <http://www.bls.gov/news.release/ecopro.nr0.htm>

PCA1, students who successfully met the required test scores could enroll in a one-year healthcare diploma program or continue to PCA2. At the outset of the study, students who completed PCA2 were qualified to enroll in one of the college's two-year healthcare degree programs without retesting, though that later changed. The Patient Care Pathway program added a third academy, Patient Care Nursing Assistant (PCNA), in 2013, after the study had started. Students who successfully completed PCNA could transition to PCA1 or (if they had the required basic skills) PCA2, or seek employment.

**Patient Care Pathway academies.** The Patient Care Pathway academies had the following characteristics:

- **Sectoral bridge program.** Programs that package occupational training and remediation of basic skills to prepare students for a specific occupational field are described as *sectoral bridge programs*. Each academy provided such a set of basic and occupational skills courses delivered over a semester.
- **Sequenced training steps.** By packaging specific sets of courses in each academy, the Patient Care Pathway program created a clear pathway to enrollment in healthcare diploma or degree programs.
- **Acceleration.** The goal of the academies was to accelerate students' entry into the college's healthcare programs by shortening the time spent on remediation for students whose reading, writing, and math skills were too low to gain admission directly. In the absence of the academies, students would have to improve their basic skills first by completing up to three semesters of coursework in the college's developmental education sequence. In comparison, the academies paired basic skills and occupational coursework in one semester.
- **Contextualization.** The academies contextualized specific basic skills courses by integrating occupational content into their curricula.

**Advising.** The Patient Care Pathway program advisors aimed to meet with assigned students at least three times during a semester. Their role was to work with students to navigate the college system and program admission process, develop an academic plan, and identify and address academic and non-academic barriers. The advisors could do this by helping students access services available at Madison College and in the community and by using an emergency fund to assist them with small, short-term financial needs.

## Pathways for Advancing Careers and Education (PACE) Evaluation

Abt Associates and its partners are evaluating the Patient Care Pathway program as part of the **Pathways for Advancing Careers and Education (PACE)** evaluation. Funded by the Administration for Children and Families (ACF) within the U.S. Department of Health and

Human Services, PACE is an evaluation of nine programs that include key features of a “career pathways framework.”

The **career pathways framework** guides the development and operation of programs aiming to improve the occupational skills of low-income adults by increasing their entry into, persistence in, and completion of postsecondary training. These students are primarily older and nontraditional. The framework describes strategies for overcoming barriers to education and training that these students can face. Key features of this framework include:

- a series of well-defined training steps;
- promising instructional approaches targeted to adult learners;
- services to address academic and non-academic barriers to program enrollment and completion; and
- connections to employment.

The Patient Care Pathway program evaluation comprises two components: An **implementation study** examined the design and operation of the program and enrolled students’ participation patterns. An **impact study** used an experimental design to measure differences in educational and employment outcomes between students randomly assigned to a group that could access the Patient Care Pathway program (treatment group) and a group that could not (control group). Using data from baseline surveys, a follow-up survey, Madison College records, and site visits, this report provides the results from the implementation study and describes the early impacts of the program (18 months after random assignment) on education and training.<sup>2</sup>

## Key Findings

This summary documents findings from the implementation study and early findings (18 months after random assignment) from the impact study, including the number of college credits students earned— the confirmatory outcome used to assess the early effects of the Patient Care Pathway program.

### Implementation Study

The implementation study examined how planned Patient Care Pathway program instruction and supportive services were implemented, patterns of engagement in the program by its

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<sup>2</sup> The analysis plan is on the ACF website: <http://www.acf.hhs.gov/opre/resource/pathways-for-advancing-careers-and-education-supplement-evaluation-design-impact-analysis-plan>. Outcomes were also registered on the What Works Clearinghouse (WWC) and Open Science Framework (OSF) sites. The analysis plan was posted to the WWC online registry of randomized control trials (RCT) on May 20, 2016. In September 2016, under the terms of a grant from the Institute of Education Sciences, the RCT registry information was removed from the WWC website and transferred to the Society for Research on Educational Effectiveness (SREE). SREE plans to re-launch the registry in late 2018, at which time the analysis plan will be available in a searchable online database. Registration on the OSF website can be found at <https://osf.io/q5weg/>.

students, and receipt of education and training and services by the treatment group members relative to the control group. Key findings from the implementation study are summarized in Exhibit ES-1 and described in detail below.

**Exhibit ES-1. Summary of Key Findings from the Patient Care Pathway Program Implementation Study**

Evaluation Question	Conclusion
Was the program implemented with fidelity to the design?	The Patient Care Pathway program implemented most components as planned, including the training and instructional approaches, with some small modifications.
How did the program deviate from the design?	<p>The program had recruitment challenges and enrolled just half of the planned study sample. Thus, the program operated at a smaller scale than planned, resulting in a small study sample and larger sampling errors, which makes it harder to detect moderate-sized impacts. The program added two instructional supports (a supplemental instructor and group tutoring sessions) intended to increase students' academic success. The advising component was less intensive than planned.</p> <p>Control group members received more guidance on course selection and registration than planned—a deviation from the study protocol that lessened the service contrast. The program manager provided this additional guidance in one-on-one intake sessions for an estimated 50 percent of control group members. However, the study team found low levels of enrollment in recommended courses in the semester after random assignment, suggesting that any effects of this additional guidance would likely be small.</p>
Were there gaps or omissions in the program design?	<p>The program aimed to move students into healthcare diploma and degree programs quickly by shortening the time required to raise basic skills levels, but it did not address other barriers at Madison College that delayed admission to and completion of healthcare programs.</p> <p>Specific college policies that created barriers to timely program admission included short and infrequent application windows, lags of up to a year between an application window and program admission and start dates, and the adoption of the Test of Essential Academic Skills (TEAS) assessment as an admission requirement partway through the random assignment period. Even after successfully gaining admission to a healthcare program, students often faced long waitlists that delayed them enrolling in core courses, which slowed their progress toward diploma or degree completion.</p>
What were students' participation patterns and experiences with program services?	<p>The majority of treatment group members (91 percent) participated in at least one of the Patient Care Pathway academies. Completion rates for the academies were high: 50 percent for PCNA, 81 percent for PCA1, and 78 percent for PCA2. However, less than a quarter of treatment group members earned a credential within the 18-month follow-up period. During the same follow-up period, only seven percent of all treatment group members gained admission to one of the healthcare programs targeted by PCA1 or PCA2. The majority of treatment group members were still enrolled in courses at the end of the follow-up period.</p> <p>The Patient Care Pathway program did not have a statistically significant impact on receipt of any education or training.</p>

- ***Recruitment challenges led the Patient Care Pathway program to operate at a smaller scale than expected.***

Throughout the study period, program staff struggled to recruit enough students to meet the evaluation's sample goals. Staff implemented strategies to increase enrollment in the program, including adding a full-time recruiter, working with a technical assistance provider, and adding PCNA to the pathway. However, at the end of the random assignment period, the program had recruited just 500 study participants—half of the target sample of 1,000.

- ***The Patient Care Pathway program delivered training largely as designed.***

The program contextualized specific basic skills courses in PCA1 and PCA2 for the healthcare field as planned. In its instructional approaches, the program aimed to emphasize active learning (e.g., group work and problem-solving tasks) and use technology to supplement in-class instruction. The program implemented these instructional approaches when possible, but instructors reported that some courses necessitated a traditional, lecture-based format.

During the first year of the study, the program added two instructional supports intended to increase students' academic success. In response to PCA2 students' difficulties with the Chemistry class, staff added a supplemental instructor who attended the class, took notes to share with students with learning disabilities who needed academic accommodations, and facilitated an optional review session each week. The program advisor also organized group tutoring for PCA1 students who needed or wanted additional instructional support. Finally, after Madison College implemented the Test of Essential Academic Skills (TEAS) assessment for those two-year healthcare program applicants, program staff added a TEAS workshop to help students prepare for it.

- ***The Patient Care Pathway program's advising was less intensive than planned, though most treatment group members received advising at least once.***

The program advisors aimed to meet one-on-one with the students assigned to them at least three times over the semester to monitor progress and address any needs. The program had a blueprint for each advising session. The initial session covered financial aid, academic and non-academic barriers to school, and course requirements. The mid-semester session focused on academic plan development. The end-of-semester session focused on academic plans and registration for the next semester's courses.

According to the participant follow-up survey, the majority of students who enrolled in training stated they received academic advising at least once (70 percent). Fewer than half (45 percent) reported receiving academic advising three or more times (i.e., the recommended minimum number of advising sessions). Students who enrolled earlier were more likely to report receiving three sessions of academic advising than were students who enrolled later (51 percent versus 32 percent). Many program participants reported receiving other types of

services, such as financial aid advising and help arranging supports for work or school. While advising was less intensive than planned, Patient Care Pathway students who received any education or training were more likely to receive advising. For the subset of treatment and control group members who reported enrolling in education or training, significantly more treatment group members ever received academic advising supports (70 percent compared with 55 percent of control group members) and received academic advising three or more times (45 percent compared with 35 percent of control group members).

- ***Control group members received more assistance with course selection and registration than planned.***

After the study period concluded, the evaluation team learned of a deviation from study procedures. Specifically, during one-on-one intake sessions the program manager provided potential study participants with specific course recommendations before random assignment. The program manager reported providing this guidance because potential study participants had detailed questions prior to random assignment about the control group pathway and how it compared to the Patient Care Pathway program available to the treatment group. She also saw this as a helpful way of marketing the program. In addition, the program manager provided some control group members assistance with registering for classes after random assignment.

The additional guidance and assistance enrolling in courses was provided to an estimated 50 percent of those ultimately assigned the control group, thus lessening the service contrast between the treatment and control groups. However, the study team examined enrollment data for the semester after random assignment and found that less than 15 percent of control group members enrolled in any of the recommended courses. This low rate suggests that the provision of guidance prior to random assignment and assistance registering control group members following random assignment is likely to have at most a small negative effect on impact estimates of educational outcomes. Given that the study population was largely recruited within the college, some proportion would have enrolled in courses even without the additional support.

- ***Healthcare program admission policies at Madison College created barriers for Patient Care Pathway academy completers to transition to and complete destination programs.***

The academies aimed to facilitate quick admission to and enrollment in “destination” healthcare diploma and degree programs by shortening the time necessary to raise students’ basic skills and meet admission requirements. However, during the study period, four factors not addressed in the design created barriers for students’ enrollment in the destination programs. First, starting in Spring 2013, Madison College required all students applying to two-year healthcare degree programs (destination programs) to take and achieve required TEAS assessment score. According to School of Health Education staff, the TEAS was a barrier to

program admission because a large share of students at Madison College, including PCA2 graduates, failed to achieve the required TEAS scores even after multiple attempts.

Second, many two-year healthcare programs had short annual application windows. Depending on when students completed a Patient Care Pathway academy, they may have had to wait up to an academic year before applying to a program (e.g., a student completing PCA2 in a fall semester (ending in December) might have to wait until the following fall (September – October) to apply). Third, some healthcare programs required that students apply one year in advance of the program start date. Even after successfully applying for and being notified of admission, a student's actual admission date would not occur until the remainder of the year had passed (e.g., the student applied for the program in September, was notified of their admission in November, but could not begin the program until the following September). A final factor—long program waitlists—delayed students' enrollment and completion of core courses once they were admitted to their destination programs. The one- to two-year waitlists for most of the healthcare programs were a barrier to steady program progress and completion because students could not enroll in core program courses and may have had little or no coursework to complete while waiting.

- ***More than 90 percent of treatment group members participated in some type of education and training, and many progressed from the Patient Care Pathway academies to credit courses outside the academies. However, only seven percent gained admission to a destination healthcare program during the 18 months following random assignment.***

Overall, 94 percent of treatment group members participated in education and training courses, including those in PCA1, PCA2, and PCNA or in other courses bearing college credit. Six percent did not enroll in any courses. Of all treatment group members, 91 percent attended one of the academies: eight percent began with PCNA, 26 percent began with PCA1, and 57 percent began with PCA2. Another four percent began with other credit or occupational courses and did not attend an academy. Eighteen percent of treatment group members enrolled in both PCA1 and PCA2 (i.e., two-thirds of PCA1 enrollees continued to PCA2); altogether, 75 percent of all treatment group members attended PCA2. Completion rates for PCA1 and PCA2 enrollees were high (81 and 78 percent, respectively); however, the completion rate for PCNA enrollees was much lower (50 percent).

While 77 percent of all treatment group members enrolled in other courses at Madison College, most commonly after completing PCA2, only seven percent of all treatment group members had gained admission to one of the healthcare diploma or degree programs targeted by PCA1 or PCA2 18 months after random assignment. Factors that could have influenced the low admission rates, as noted above, include short and infrequent application windows, lags of up to a year between application and program admission and start dates, and the adoption of the TEAS assessment as an admission requirement.

- *The Patient Care Pathway program did not have a statistically significant impact on the proportion of program participants receiving any education or training.*

Similar majorities of students in the treatment (81 percent) and control (77 percent) groups reported enrolling in education and training in any subject after random assignment.<sup>3</sup> Majorities of students in both groups also reported enrolling in education and training in a healthcare occupation (67 percent of treatment members and 60 percent of control members). Thus, the program did not produce statistically significant impacts on training receipt. This lack of impact may be partially due to recruitment strategies (i.e., the program recruited heavily from within the college, so a large share of both groups were already enrolled in courses or seeking to do so).

### Impact Study

The impact study reports estimates of the Patient Care Pathway program’s early impacts on educational attainment, career progress, and a small number of non-economic outcomes. The main estimates cover impacts over an 18-month period after random assignment for the full sample of treatment and control group members. Key findings from the impact study are summarized in Exhibit ES-2 and described in more detail below.

#### Exhibit ES-2. Summary of Key Findings from the Patient Care Pathway Program Impact Study

Evaluation Question	Conclusion	Findings
What were the effects of the program on average total number of college credits earned (confirmatory)?	The Patient Care Pathway program did not increase the number of college credits earned 18 months after random assignment, the confirmatory outcome of interest.	Total number of college credits earned (average): <ul style="list-style-type: none"> <li>• Treatment: 12.0</li> <li>• Control: 11.1</li> <li>• (Difference is not statistically significant)</li> </ul>
What were the effects of the program on receipt of occupational training (secondary)?	There were increases in the percentages receiving college occupational training at successive follow-up intervals. Treatment group members were seven to 10 percentage points more likely than control group members to be enrolled in occupational training at successive six-month follow-up durations and seven points more likely to have any such enrollment over the entire follow-up period.	Enrolled in college occupational training in any month after random assignment (average): <ul style="list-style-type: none"> <li>• Treatment: 88.1%</li> <li>• Control: 81.5%</li> <li>• (Difference is statistically significant at the five-percent level)</li> </ul>

<sup>3</sup> These proportions represent the percentages of treatment and control group members who reported in the follow-up survey that they participated in an education or training program at Madison College or elsewhere. These values differ from the proportions calculated from administrative data, accounting for the difference between the 94 percent and 81 percent education and training participation rates for the treatment group reported here.

**Exhibit ES-2. Summary of Key Findings from the Patient Care Pathway Program Impact Study (continued)**

Evaluation Question	Conclusion	Findings
What were the effects of the program on hours of occupational training (secondary)?	There were no statistically significant impacts on hours of occupational training.	Total hours of occupational training at any institution (average): <ul style="list-style-type: none"> <li>• Treatment: 230.4</li> <li>• Control: 226.7</li> <li>• (Difference is not statistically significant)</li> </ul>
What were the effects of the program on credential receipt (secondary)?	There were no statistically significant impacts on credential receipt.	Received a credential from any source: <ul style="list-style-type: none"> <li>• Treatment: 50.5%</li> <li>• Control: 48.6%</li> <li>• (Difference is not statistically significant)</li> </ul>
What were the effects of the program on admission to the healthcare programs targeted by the academies (destination program) (exploratory)?	At 18 months after random assignment, there was no statistically significant effect on admission to a healthcare program.  However, by 35 months, there was a statistically significant impact: 27 percent of the treatment group had enrolled in a destination program as compared with 17 percent of the control group.	Admission to any academy destination program at 18 months: <ul style="list-style-type: none"> <li>• Treatment: 6.8%</li> <li>• Control: 7.2%</li> <li>• (Difference is not statistically significant)</li> </ul> Admission at 35 months: <ul style="list-style-type: none"> <li>• Treatment: 27.0%</li> <li>• Control: 17.3%</li> <li>• (Difference is statistically significant at the one-percent level)</li> </ul>
What were the effects of the program on indicators of career progress (secondary)?	Measures of perceived career progress, confidence in career knowledge, and access to career supports were used to assess a student's progress toward career goals. Of these, there was a statistically significant impact on only perceived career progress.  The program had positive, statistically significant impacts on a measure of academic self-confidence; the treatment group members had a significantly higher score than control group members.  The program had a positive impact on whether life challenges affected school, work, or other responsibilities. Here, the treatment group had a lower average score (i.e., fewer life challenges) than the control group.	Perceived career progress (average on three-item four-point scale tapping self-assessed career progress): <ul style="list-style-type: none"> <li>• Treatment: 3.57</li> <li>• Control: 3.43</li> <li>• (Difference is statistically significant at the five-percent level)</li> </ul> Academic self-confidence (average on 12-item four-point scale capturing academic self-confidence): <ul style="list-style-type: none"> <li>• Treatment: 4.53</li> <li>• Control: 4.39</li> <li>• (Difference is statistically significant at the 10-percent level)</li> </ul> Life challenges (average on seven-item four-point scale capturing life challenges that interfere with school, work, or family responsibilities): <ul style="list-style-type: none"> <li>• Treatment: 1.48</li> <li>• Control: 1.59</li> <li>• (Difference is statistically significant at the five-percent level)</li> </ul>

In summary, the Patient Care Pathway program did not have a statistically significant affect the confirmatory outcome for this analysis period: total number of college credits earned over an initial 18-month follow-up period. Similarly, it did not increase the likelihood of earning a certificate or other college credential. The program did increase enrollment in credit-bearing courses over the 18-month period. The latter finding, and initial indications of positive longer-

term impacts on transitions to targeted destination programs, leaves some room for optimism about longer-term impacts.

- *The Patient Care Pathway program had no impact on average total number of college credits earned, the confirmatory outcome for the early (18-month) analysis of this program.*

As Exhibit ES-3 shows, the program did not increase the number of college credits<sup>4</sup> earned 18 months after random assignment, the confirmatory outcome of interest. On average, the treatment group earned 12.0 credits in the 18-month follow-up period and the control group earned 11.1 credits.

**Exhibit ES-3. Early Impacts on Educational Outcomes (18 Months after Random Assignment)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value
<b>Confirmatory Outcome</b>					
Total number of college credits earned (average)	12.0	11.1	+0.8	0.9	.176
<b>Secondary Outcomes</b>					
Enrolled in college occupational training in successive months after random assignment (%)					
Months 1-6	84.4	76.7	+7.7 **	3.4	.013
Months 7-12	70.6	63.5	+7.2 **	4.1	.042
Months 13-18	65.3	55.8	+9.5 **	4.2	.013
Any month	88.1	81.5	+6.5 **	3.2	.020
Total number of college credits earned in successive months after random assignment (average)					
Months 1-6	4.0	3.7	+0.3	0.3	.166
Months 7-12	4.4	4.1	+0.4	0.4	.186
Months 13-18	3.5	3.4	+0.1	0.4	.361
All months	12.0	11.1	+0.8	0.9	.176
Total hours of occupational training at (average)					
A college	205.0	195.1	+9.8	15.8	.268
Another place	10.8	3.7	+7.1	8.1	.191
Any place	230.4	226.7	+3.7	20.8	.430
Received a credential from (%)					
A college	16.4	15.7	+0.8	3.3	.410
Another education and training institution	0.7	3.5	-2.8	1.5	.967
A licensing/certification body	47.8	41.6	+6.2	5.3	.122
Any source	50.5	48.6	+2.0	5.2	.354
Sample size <sup>a</sup>	250	249			

SOURCE: Abt Associates calculations based on data from Madison College records and the PACE short-term follow-up survey.  
 NOTES: Statistical significance levels, based on one-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.  
<sup>a</sup> Sample sizes in this row apply to estimates based on college records for the full sample. In the last two panels (total hours of occupational training and credentials by place), estimates for activity at a college are based on college records for the full sample, whereas all other estimates (including those for activity at any source) are based on the subsample who responded to the PACE follow-up survey (181 program and 173 control group members).

<sup>4</sup> The number of college credits does not include developmental education courses, as Madison College did not award credit for such courses.

- ***The Patient Care Pathway program produced impacts on enrollment in occupational training.***

Treatment group members were seven to 10 percentage points more likely than control group members to be enrolled in occupational training at successive six-month follow-up durations. They were seven percentage points more likely to have any such enrollment over the entire follow-up period. This higher enrollment was insufficient to generate statistically significant credit gains.<sup>5</sup> Nor did the analysis show statistically significant impacts on hours of occupational training or credential receipt.

- ***There was no impact on admission to the healthcare diploma and degree programs targeted by the Patient Care Pathway academies (“destination programs”) at 18 months, but there were positive impacts on program admission rates later.***

Admission to a healthcare program is a main intermediate goal of the academies and a major milestone along a student’s pathway to completion of such a program.<sup>6</sup> At 18 months, there was no statistically significant effect on admission rates. However, by 30 months, treatment group members were more likely to gain admission to a destination program. By 35 months, 27 percent of the treatment group had enrolled in a destination program, compared with 17 percent of the control group. This difference is statistically significant at the one-percent level. This 10 percentage point impact results entirely from an effect on admission to PCA2 destination programs. It is notable that even with this positive impact, of students who successfully completed PCA2 by 18 months (59 percent), only about one-third gained admission to PCA2 destination program by 35 months (20 percent of the treatment group). This indicates that some effect on program admission occurred, but substantially later than the theory of change implied and the research team expected.

- ***There were few signs of positive effects of the Patient Care Pathway program on early career progress or other exploratory outcomes over the 18-month follow-up period.***

The research team investigated the impact of program participation on several indicators of career progress. Measures of perceived career progress, confidence in career knowledge, and access to career supports were used to assess a student’s progress toward career goals. Of these, there was a statistically significant impact on only perceived career progress. The research team also examined exploratory outcomes in four additional domains: employment, psycho-social skills, life stressors, and family structure. Among these domains, the program had positive, statistically significant impacts on only two outcomes. On a measure of academic self-

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<sup>5</sup> Though the percentage difference in credits earned and in enrollment in occupational training in any month is similar, the difference relative to the standard error (effect size) is smaller in the case of credits. This accounts for the effect on enrollment being statistically significant and the effect on credits not being significant.

<sup>6</sup> The research team learned of the availability of the admission data after the analysis plan was made public. As a result, this analysis is exploratory.

confidence, treatment group members had a significantly higher score than did control group members. There also was evidence of a positive impact on whether life challenges affected school, work, or other responsibilities, in that the treatment group had a lower average score (i.e., fewer life challenges) than did the control group. The increase in short-term educational outcomes such as academic self-confidence and the decrease in life challenges could possibly lead to improved academic achievement in the longer term.

### Next Steps in the Patient Care Pathway Evaluation

This report on the Patient Care Pathway program focuses on its implementation and early effects on participating students' education and training. The emphasis on educational outcomes reflects an expectation that in the first 18 months, students' major focus would be on coursework and credits, without enough time for positive employment impacts flowing from those educational outcomes to emerge.

The next PACE report on the Patient Care Pathway program will analyze longer-term educational outcomes at approximately **36 months after random assignment**. In addition, it will include a more systematic look at impacts on employment and earnings. The most critical question that the next, and possibly subsequent, analyses will address is whether the Patient Care Pathway program's positive effects on admission to two-year degree programs will translate into effects on treatment group members' earning of credits and credentials.

## 1. Introduction

Over the next 10 years, the fastest-growing occupational groups will be in healthcare (Bureau of Labor Statistics 2015). Meeting the need for more healthcare workers is important to both satisfy the nation’s healthcare needs and support the economy. This demand also creates opportunities for low-income adults to gain entry-level employment and advance to higher-skilled jobs. How to enable the match between the nation’s need for a skilled workforce and low-income, low-skilled adults’ need for employment is a topic of great interest to policymakers, workforce development organizations, educators, and other key stakeholders.

This report provides early evidence on the implementation and impacts of one effort to meet both sets of needs: the **Patient Care Pathway program** operated between 2011 and 2014<sup>7</sup> by **Madison Area Technical College** (hereafter referred to as Madison College), a community college in the Madison, Wisconsin, area.

Almost all jobs in healthcare require some level of education or training beyond high school. The required training can take weeks to complete for jobs requiring entry-level skills up to multiple years for jobs requiring higher-level skills. Many low-income, low-skilled adults face considerable barriers to completing even short-term training for entry-level jobs. Many are “nontraditional” students—that is, older, often parents, lacking adequate basic academic skills, and with few economic resources (NCES 2016). Often they enroll in college to obtain occupational certifications rather than academic degrees.

On average, nontraditional students fare poorly in postsecondary settings (Visher et al. 2008; Cooper 2010; Goldrick-Rab and Sorensen 2010). Institutions often assign students who need to improve their basic academic skills to developmental education courses; many students never progress beyond this coursework (Bailey, Jeong, and Cho 2010). Others drop out after financial setbacks or difficulties juggling school, work, and family responsibilities. Some have difficulties navigating the college environment, including course sequences and financial aid. Many have difficulty meeting academic standards (Bridges to Opportunity Initiative 2008).

An impetus for the Patient Care Pathway program was the large number of prospective healthcare students who were denied admission to the college’s healthcare programs due to low math, reading, and writing scores on admission tests of basic skills—some 1,120 applicants in 2011 alone. Madison College staff estimated that 75 percent of students who were denied admission subsequently never enrolled in a healthcare program.

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<sup>7</sup> Madison College ended the Patient Care Pathway program after the spring 2014 semester, but continues to offer a version of one of its components (Patient Care Academy 2—described below) through a different department at the College.

Prior to implementation of the Patient Care Pathway program, students with test scores too low to be admitted to a Madison College healthcare program had two options. The first was completing as many as three semesters of developmental education classes at the college or elsewhere. Students who passed the required remedial courses then could be admitted directly into their healthcare program of choice without retesting. Alternatively, students who raised their basic skills on their own could retest and be admitted if they scored high enough.

To address this issue, Madison College created a third option for students. Under the umbrella of the Patient Care Pathway program, it created two short-term “academies”—**Patient Care Academy 1 (PCA1)** and **Patient Care Academy 2 (PCA2)**. Both aimed to promote enrollment in and accelerate completion of college-level diploma and degree programs by shortening the length of remediation to one semester while also allowing lower-skilled students to pursue basic skills and occupational training simultaneously. Both academies based their design on earlier College bridge programs—that is, short-term programs that packaged basic skills instruction with occupational content. In 2011, Madison College adapted and linked those two bridge programs and added an advising component. In 2013, Madison College added a third academy—**Patient Care Nursing Assistant (PCNA)**.

Abt Associates included the Patient Care Pathway program in the **Pathways for Advancing Careers and Education (PACE) evaluation**, a study of programs embodying elements of the career pathways framework, funded by the Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services.<sup>8</sup> The design and implementation of the program occurred concurrently with the evaluation. Madison College received support from a grant to Abt Associates by the Open Society Foundations (OSF) and directly from the Joyce Foundation to fund a substantial portion of the Patient Care Pathway program’s development and operation.

All three one-semester academies combined basic skills courses, occupational courses, and one-on-one advising. As an alternative to traditional remediation, PCA1 prepared students to enter either a one-year healthcare diploma program or the second academy level. PCA2 prepared students for any of the college’s two-year healthcare degree programs. PCNA prepared students to transition to PCA1 or (if they had the required basic skills) PCA2 or to seek employment as a certified nursing assistant or in another healthcare occupation.

The evaluation of the Patient Care Pathway program included both an **implementation study** to examine the program’s design and operation and an **impact study** that used a random

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<sup>8</sup> More information on the PACE evaluation can be found on ACF’s Office of Planning, Research and Evaluation website: <http://www.acf.hhs.gov/opre/research/project/pathways-for-advancing-careers-and-education>. Additional information on PACE and other ACF-sponsored career pathway program evaluations is also available at [www.career-pathways.org/](http://www.career-pathways.org/).

assignment research design to estimate the impacts of access to the program on students' education and training, employment, and other outcomes.

This report describes Patient Care Pathway implementation and early impact findings on participant outcomes over an approximately 18-month follow-up period.<sup>9</sup> The rest of this chapter describes the PACE evaluation, summarizes findings from the research literature regarding the type of components implemented by the Patient Care Pathway program, and provides an outline for the rest of the report.

## 1.1 Pathways for Advancing Careers and Education (PACE) Evaluation

Funded by ACF, the PACE evaluation is a 10-year study of nine programs that include key features of a **career pathways framework**.

This framework guides the development and operation of programs that aim to improve the occupational skills of low-income individuals, primarily older nontraditional students, by increasing their entry into, persistence in, and completion of postsecondary training. Central to accomplishing these improved outcomes, the framework describes signature strategies for overcoming the barriers that nontraditional, occupational students often face.

Key features of programs within this career pathways framework include (Fein 2012):

- a series of well-defined training steps;
- promising instructional approaches;
- access to supportive services; and
- connections to employment.

### Programs in PACE

- Bridge to Employment in the Healthcare Industry, at San Diego Workforce Partnership, San Diego, CA
- Carreras en Salud, at Instituto del Progreso Latino, Chicago, IL
- Health Careers for All, at Workforce Development Council of Seattle-King County, Seattle, WA
- Pathways to Healthcare, at Pima Community College, Tucson, AZ
- Patient Care Pathway Program, at Madison College, Madison, WI
- Valley Initiative for Development and Advancement (VIDA), at Lower Rio Grande Valley, TX
- Washington Integrated Basic Education and Skills Training (I-BEST) program, at three colleges (Bellingham Technical College, Whatcom Community College, and Everett Community College) in Washington State
- Workforce Training Academy Connect, at Des Moines Area Community College, Des Moines, IA
- Year Up (in Atlanta, Bay Area, Boston, Chicago, National Capital Region, New York City, Providence, Seattle)

Programs consistent with the career pathways framework typically have multiple components, reflecting the multi-dimensional challenges facing nontraditional students in succeeding in college and careers. The career pathways framework is flexible however, and not a specific

<sup>9</sup> The time frame was selected because on average, students completed the 15-month follow-up survey 18-19 months after random assignment.

program model. Thus, which components a local program adopts and how it implements them can vary greatly. For instance, the Patient Care Pathway program did not include employment supports because it prepared its participants (except PCNA completers) to progress toward a healthcare diploma or degree rather than to seek immediate employment. The program also did not include financial supports for tuition beyond the federal financial aid available to the general Madison College student population.

Reflecting this diversity, each of the nine programs in the PACE evaluation represents a different program model. All share some program components that are part of the career pathways framework, but each also has distinct and unique elements, reflecting the target populations, occupational trainings offered, and industries of focus. Because they vary, PACE evaluates and reports findings for the programs individually.<sup>10</sup>

The central goal of the PACE evaluation is to determine the effectiveness of each of the nine programs using a common evaluation design and conceptual framework (**impact study**). The most critical element of the evaluation design is **random assignment** of eligible applicants either to a **treatment group** that can enroll in the program or to a **control group** that cannot enroll but can use other similar services available at the institution and in the community. Random assignment ensures that the study's treatment and control groups are equivalent in their observed and unobserved characteristics at the start of the study. Thus, any systematic differences in their subsequent outcomes can be attributed to the treatment group having access to program services—these differences being the program's **impacts**. Systematic differences in outcomes due to the characteristics of individual members in each group can be ruled out.

Consistent with this career pathways framework and the career pathways theory of change (described in Chapter 2) guiding the PACE evaluation, the key outcomes for which the PACE study estimates effects are in the **education and training and employment** areas, although the study also estimates effects in other areas, such as family well-being.

The PACE **implementation and early impact reports** analyze outcomes over an approximately **18-month period after random assignment**. The impact analyses rely primarily on **surveys and college records** for treatment group and control group members. Future reports will analyze outcomes approximately three and six years after random assignment.<sup>11</sup> These latter two sets of reports will also include benefit-cost studies for some of the nine PACE programs.

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<sup>10</sup> All PACE-related reports can be found on [www.acf.hhs.gov/opre/research/project/pathways-for-advancing-careers-and-education](http://www.acf.hhs.gov/opre/research/project/pathways-for-advancing-careers-and-education) as well as [www.career-pathways.org](http://www.career-pathways.org).

<sup>11</sup> These reports will be produced under the Career Pathways Intermediate Outcomes Study and the Career Pathways Long-Term Outcomes Study, respectively.

## 1.2 Key Components of the Patient Care Pathway Program

To create the Patient Care Pathway program, Madison College staff adapted and linked two existing healthcare bridge programs, seeking to incorporate a number of promising strategies from the career pathways framework.

The Patient Care Pathway program's one-semester academies provided academic preparation for and an on-ramp to the college's healthcare degree and diploma programs, as well as advising supports to promote student success. Depending on their basic skills level, students could start with either PCA1 or PCA2 and build their skills while they acquired occupational knowledge relevant for their chosen healthcare diploma or degree program.

Students who completed PCA1 (and scored high enough on a retest of their basic skills) could then either enroll in any of the one-year healthcare diploma programs or proceed to PCA2. Students who completed PCA2 qualified to enroll directly (without retesting) in any of the college's two-year healthcare degree programs. Students who completed PCNA could transition to PCA1 or PCA2 or seek employment.

### Patient Care Academies

The academies had the following characteristics:

- **Sectoral bridge program.** Programs that package occupational training and remediation of basic skills to prepare students for a specific occupational field are described as *sectoral bridge programs*. There is some evidence that bridge programs that have basic skills students enroll in occupational coursework lead to improved student outcomes, such as an increase in college credits and occupational certificates earned (Zeidenberg, Cho, and Jenkins 2010). Each Patient Care Pathway academy provided a set of courses delivered over a semester. The sets included both occupational training and remedial basic skills education.
- **Sequenced training steps.** By packaging specific sets of courses in each academy, the Patient Care Pathway program aimed to provide academic preparation for and a clear pathway toward enrollment in a healthcare diploma or degree program. There is evidence that traditional community college students can have difficulty navigating courses to efficiently obtain high-valued credentials; for example, students can have problems identifying the correct course sequence from a catalog (Jenkins and Cho 2012; Scott-Clayton 2011). The Patient Care Pathway sought to provide its students with strong, ready-made plans of study.
- **Acceleration.** The goal of the Patient Care Pathway program was to accelerate students' entry into the college's healthcare programs by shortening the period of remediation for applicants whose basic skills tested too low to gain admission directly. In the absence of the Patient Care Pathway program, students would have to improve their basic skills

first, on their own or by completing as many as three semesters of coursework in Madison College's developmental education sequence. In comparison, the Patient Care Pathway academies paired basic skills and occupational coursework in one semester.

The shortened remediation period addressed the concern that most students referred to developmental education never enroll in college-level courses (Bailey, Jeong, and Cho 2010). There is also some evidence that compressing developmental education into shorter periods can improve outcomes for low-skilled students (Rutschow and Schneider 2011).

- **Contextualization.** The program contextualized specific basic skills courses in each academy by integrating occupational content into their curricula. Evidence for the effectiveness of contextualization is not strong. Relatively few studies of contextualized basic skills instruction have been conducted in a college setting, and most studies did not use a randomized control trial research design (Perin 2011).

### Advising

The Patient Care Pathway program provided dedicated advisors to proactively and frequently reach out to their assigned students. Per the design, the advisors would help students to navigate the college system and program admission process, develop an academic plan, and identify and address academic and non-academic barriers. The advisors addressed barriers by referring students to resources at Madison College and within the community and by using an emergency fund to assist them with small, short-term financial needs.

The intent of the advising feature was to counter the common experience that college advisors often have very high student-to-advisor ratios, leaving little time for individual counseling (Grubb 2001). Several rigorous studies have demonstrated that enhancing existing advising services with more-intensive advising, sometimes combined with other services, can lead to greater persistence in education, although sometimes only in the short term (Bettinger and Baker 2011; Scrivener and Weiss 2009).

## 1.3 Structure of This Report

The organization of the remainder of this report is as follows:

- Chapter 2 presents the Patient Care Pathway program theory of change and the evaluation's conceptual framework and research questions; details the evaluation design; describes the study sample; and summarizes the evaluation's data sources.
- Chapter 3 describes the Patient Care Pathway program's context, design, and administrative structure.
- Chapter 4 presents the implementation study findings, including changes to the program design to address challenges in implementation, participation in the Patient

Care Pathway program by treatment group members, and an overall comparison of participation in education and training across the treatment and control groups.

- Chapter 5 presents the impact study’s early findings, focusing on the main impact—number of college credits earned over an 18-month follow-up period—as well as a series of other education, career, and life outcomes.
- Chapter 6 discusses the implications of the implementation and impact findings.

Appendix A provides the full program eligibility criteria for the Patient Care Pathway program. Next, four technical appendices provide additional detail on the data and methods in this report. Appendix B describes data collected at baseline, gives further detail on baseline characteristics of treatment and control group members, and explains procedures for using these data to adjust for imbalances arising by chance during random assignment. Appendix C describes college records data serving as the main source for measuring program impacts on educational progress. Appendix D provides detail on survey-based outcome measures, adjustments for item nonresponse, and analyses of survey nonresponse. Appendix E documents the research team’s approach to outliers, or extreme values, in the analysis.

## 2. PACE Evaluation Design and Data Sources

This chapter describes the larger PACE evaluation design and its application to the Patient Care Pathway program. It begins with a discussion of the PACE career pathways theory of change and the research questions that the theory of change implies. It then briefly describes the evaluation design and analysis procedures for the impact study, including the random assignment process and its outcome. A brief description of the implementation study analysis follows.<sup>12</sup> The chapter concludes with a summary of the main data sources for the implementation and impact studies.

### 2.1 Career Pathways Theory of Change

The career pathways theory of change guides the implementation study (i.e., it identifies which aspects of program services are expected to affect outcomes) and the impact study (i.e., it identifies which outcomes the program is expected to affect). The theory of change also generates key hypotheses about the direction of expected effects that the impact evaluation will test for statistically significant change.<sup>13</sup> Finally, the theory of change implicitly assumes time horizons by which the program is expected to have effects, determining the key outcomes at any particular time of follow-up.

Exhibit 2-1 depicts the PACE career pathways theory of change, as applied to the Patient Care Pathway program.<sup>14</sup> It shows how a program (inputs) is hypothesized to produce effects on intermediate outcomes, which in turn will lead to effects on main outcomes. Effects on intermediate outcomes are expected earlier than effects on main outcomes, with the exact timing depending on particular features of the program, such as the length of occupational training and what, if any, steps precede it. In addition, because effects on intermediate outcomes might persist over time or might grow, the study will also measure them at later points in time.

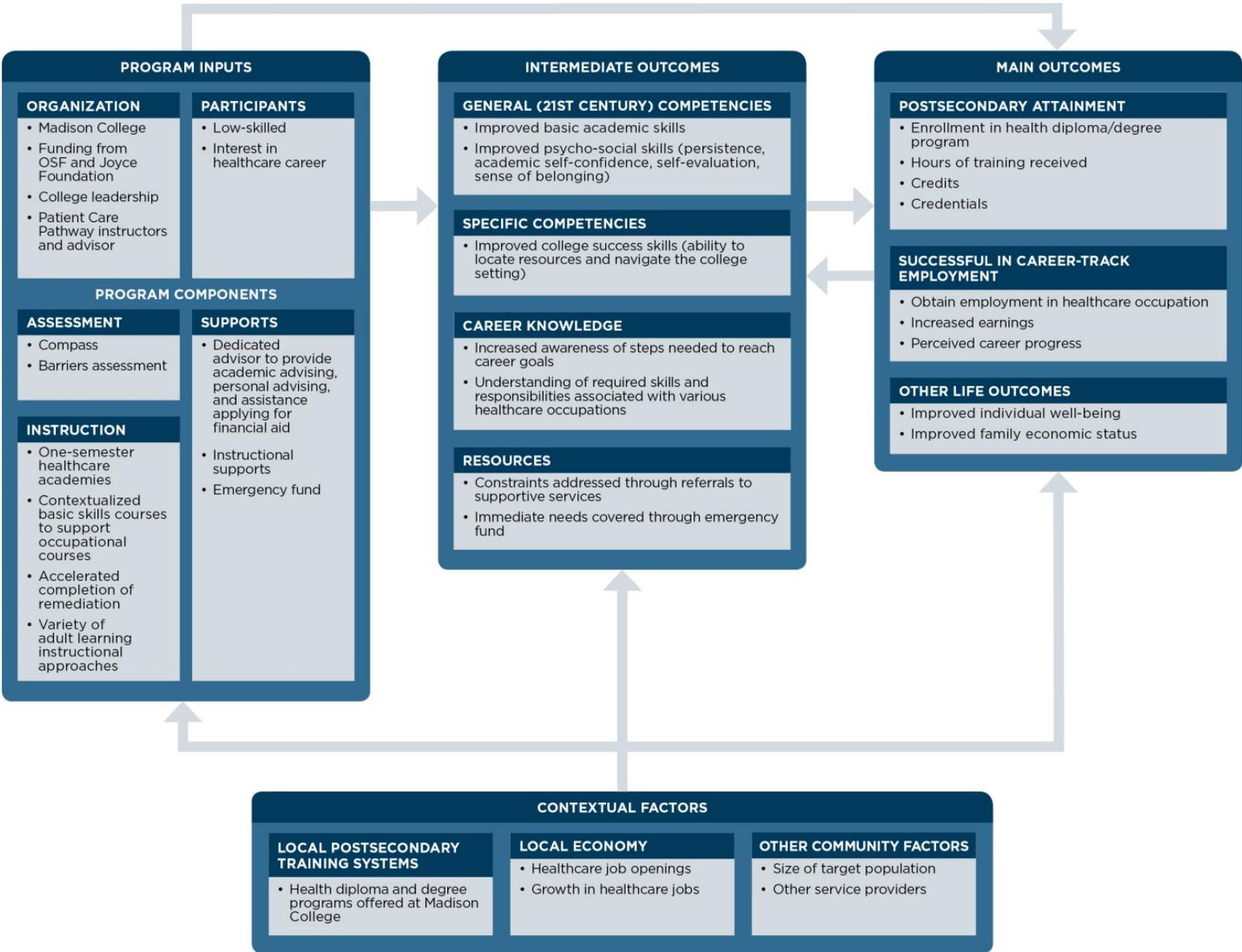
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<sup>12</sup> See Abt Associates (2014) for a report describing the PACE evaluation design in detail.

<sup>13</sup> The implementation study describes the set of services that students in the treatment group experienced. It includes a small number of impact estimates to show the difference in services received between treatment and control group members. The impact study focuses solely on estimates of the effects of the program on intermediate and main outcomes.

<sup>14</sup> See Fein (2012) for an extended description of the framework.

**Exhibit 2-1. Career Pathways Theory of Change (for the Patient Care Pathway Program)**



As shown in Exhibit 2-1, starting in the box at the left, the career pathways theory of change begins with two types of program inputs:<sup>15</sup>

- **Organization.** Organizational inputs include the college operating the program (Madison College), funding (grants from the Open Society Foundations and the Joyce Foundation), college leadership (deans of the college departments delivering the program), and staff (dedicated advisor and instructors).
- **Participants.** This input includes the characteristics of the target population (low-skilled individuals with an interest in a healthcare career).

This same box includes three kinds of program components that are expected to improve participant outcomes by overcoming specific barriers that are hypothesized to impede successful entry into and completion of occupational training:

- **Assessment.** The Patient Care Pathway program used ACT's Compass™ assessment to determine whether an applicant's basic skills fell below the level required for Madison College's healthcare diploma and degree programs, making the applicant eligible for the Patient Care Pathway program. It also developed an assessment to identify potential non-academic barriers to academic success.
- **Instruction.** Students enrolled in one or more one-semester academies. These provided academic preparation and an accelerated path through remediation in the form of occupational courses (e.g., Medical Terminology, Chemistry), supported by basic skills courses, and a variety of adult learning instructional approaches (e.g., contextualization).
- **Supports.** The Patient Care Pathway's key support was one-on-one advising. Students could also access an emergency fund for small, short-term financial needs. The program did not include instructional supports (e.g., test workshops, group tutoring) in the original design, but added them during the study period in response to student needs.

The middle box shows the **intermediate outcomes**—targeted improvements expected to lead to better main outcomes. These intermediate outcomes include improved basic skills and improved psycho-social skills such as grit and academic self-confidence; improved college success skills; understanding of healthcare occupations and career goals; and reduced financial hardship.

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<sup>15</sup> Program inputs can include components available only to treatment group members as well as components available to both treatment and control group members, because the interaction of the two types of components can lead to impacts.

In the far right box, the **main outcomes** are the primary targets that programs such as the Patient Care Pathway program seek to change:

- **Increased postsecondary attainment**, namely accumulated hours and credits (as measures of progress toward a credential) and occupational training credentials. For the Patient Care Pathway program, admission into and enrollment in a healthcare diploma or degree program is a necessary step toward postsecondary attainment.
- **Successful employment**, including obtaining employment in a healthcare occupation, increasing earnings and job benefits, and career progress.
- **Improvements in other life outcomes** such as individual well-being.

Influencing expected effects are a number of **contextual factors** including the types and number of postsecondary training systems in the local area (including the specific healthcare diploma and degree programs offered at Madison College); the local economy (in particular, healthcare jobs); and other community factors such as the size and characteristics of the target population and the number and nature of service providers outside the program.

## 2.2 Research Questions for Evaluation of the Patient Care Pathway

The implementation study documented the Patient Care Pathway program as it operated during the PACE study period and captured participation patterns of treatment group members in training and other activities (see Chapter 4 for implementation findings). The impact study aimed to measure the effectiveness of the program in improving students' intermediate and main outcomes (see Chapter 5 for impact findings).

### Research questions for the implementation study

- What is the intended program model? What is its institutional and community context?
- What intervention did the college actually implement? Did it deviate from plans or expectations?
- What were the treatment group's participation patterns and experiences with program services?
- What are the differences in services, including training, received by treatment and control group members?

### Research questions in the impact evaluation

- What were the Patient Care Pathway program's main effects on:
  - Educational attainment, including number of credits earned, hours of occupational training received, credentials received, and other educational outcomes?
  - Entry into career-track employment, higher-wage jobs, earnings, and perceptions of career progress?

- Participant and family well-being, including income and material hardship?
- To what degree did the program affect intermediate outcomes in the theory of change, such as:
  - Confidence in career knowledge and access to career supports?
  - Psycho-social skills such as grit, academic self-confidence, core self-evaluation, and social belonging at school?
  - Life stressors, such as financial hardship, life challenges, and perceived stress?

As mentioned, the program’s theory of change not only describes hypothesized causal connections, it also identifies time horizons over which outcomes are expected to occur. For example, for the Patient Care Pathway program, students whose first step is PCA1 or PCA2 required one semester to successfully complete the academy. PCA1 students interested in a two-year healthcare degree then required another semester to complete PCA2. According to Madison College staff, during the study period many of its healthcare programs had waitlists ranging from one to three years, so at least some students who completed an academy and were accepted to a healthcare program had to wait two semesters or more before they could begin taking core courses in that program. The healthcare programs themselves then take one or two years to complete. Given all this, the research team expected many treatment group members who worked toward a one-year diploma or two-year degree to still be in training at the end of the study’s 18-month follow-up period. Thus, this early impact report focuses primarily on training outcomes other than program completion or credential receipt.

For this report, the primary data sources for addressing the impact study research questions are Madison College records, two surveys administered at study intake, and a follow-up survey of treatment and control group members initiated at approximately 15 months after students’ random assignment into the study. The implementation study questions use information gathered during site visits and monitoring calls and from an instructor survey. A more complete description of data sources is in the concluding section of this chapter.

Later PACE reports will have greater focus on employment outcomes and on education and training outcomes resulting from activities that require a longer time to complete (e.g., earning an associate’s degree). Longer-term analysis is important for assessing whether initial career success is followed by further progress up career ladders.

## **2.3 PACE Evaluation Design and Analysis**

As mentioned in Chapter 1, the PACE evaluation uses a random assignment research design to estimate the impact of having access to a particular program with elements of the career pathways framework on its students’ outcomes. When properly implemented, a randomized control design ensures that estimated effects reliably can be attributed to program access and

not to unmeasured differences in characteristics or external circumstances between individual students *with* access to the program (treatment group) versus *without* access (control group).

However, maintaining the comparability of the treatment and control groups requires comparing *all* of those in the treatment group with *all* of those in the control group, regardless of whether or not group members actually enrolled in the program of interest (what researchers refer to as an “intent-to-treat” analysis). A critical implication of this is that the PACE evaluation estimates the impact of access to the *entire program* as opposed to the impact of participation in the program’s specific components. The research team thus compares the entire control group with the entire treatment group with access to the Patient Care Pathway regardless of the treatment students’ actual take-up of any particular program component or any component at all.

A second feature of the PACE impact study design is that both treatment and control group members can access education and other services in the community that are not exclusive to the program of interest. For the Patient Care Pathway program, the evaluation estimates the effect of its components *above and beyond* what was otherwise available at Madison College and elsewhere in the community during the study period. For example, both treatment and control group members could access non–Patient Care Pathway courses for which they were eligible. They could also access tutoring, disability services if eligible, general advising, counseling, and other services available at Madison College. Both treatment and control group members could enroll in the college’s healthcare diploma and degree programs, but they likely followed different paths to qualify for them (the Patient Care Pathway academies versus traditional developmental education).

In summary, the PACE impact study assesses whether access to the Patient Care Pathway program led to better outcomes for students who were offered the chance to participate in it, given what these students could have obtained *without* access to the program.

### 2.3.1 Intake and Random Assignment Procedures

The research team worked closely with each program in the PACE evaluation to design and implement program intake and random assignment procedures. The steps in the procedures for the Patient Care Pathway program specifically were as follows:

- **Recruitment.** Madison College was responsible for recruiting eligible and interested applicants for the Patient Care Pathway program. Program staff had to recruit twice as many potential students as they planned to serve in order to be able to assign half to a control group. Most recruitment efforts were internal to Madison College (e.g., outreach to college applicants and existing college students; referrals from the testing center; referrals from department advisors). A Patient Care Pathway staff member held information sessions for interested applicants, either in groups or one-on-one, to describe the program’s services, its eligibility requirements, and how random

assignment governed program admission. If needed, applicants scheduled a time to complete the Compass assessment to determine their eligibility for the program. Students with recent Compass scores or equivalent coursework could bypass the assessment.

- **Eligibility.** Next, applicants attended a study intake appointment, either in a group or one-on-one, where staff confirmed their eligibility for the program. Eligibility was based on the applicants' educational program goals (i.e., desire to pursue a healthcare diploma or degree) and academic skills level, as determined by Compass scores or completion of equivalent coursework at Madison College (see Appendix A for the full eligibility criteria).
- **Informed consent.** After determining eligibility, staff discussed the PACE evaluation and provided a copy of its informed consent form. Applicants who declined to sign the informed consent form were not included in the study and were not eligible for the Patient Care Pathway program.<sup>16</sup> Those who signed the form became study participants.
- **Baseline data.** Study participants completed a Basic Information Form (BIF) and a Self-Administered Questionnaire (SAQ). The BIF collected demographic and economic information. The SAQ measured a variety of attitudes, beliefs, and psycho-social dispositions, as well as more-sensitive personal characteristics such as financial security and criminal background.
- **Random assignment.** Program staff used an online system to randomly assign study participants. The treatment and control groups each comprised approximately half of the research sample.
- **Services according to random assignment status.** Program staff informed study participants of their group assignment. Study participants assigned to the treatment group had access to Patient Care Pathway academies and advising services, and advisors helped them enroll in academy courses immediately after random assignment (but they were not required to do so). Those assigned to the control group could not access Patient Care Pathway services, but could access any similar services available in the community, including at Madison College. Non-PCPP advisors were available on-site (but not in the classroom) to help control group members register for other college classes after random assignment.

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<sup>16</sup> According to program staff, of those who declined to participate in the Patient Care Pathway program, most did so because they determined that it was not a good fit for their educational and personal needs. Few cited the study as the reason for declining to participate.

Between December 2011 and January 2014, Madison College staff randomly assigned 500 study participants: 251 to the treatment group and 249 to the control group. For reasons described later in this report (Section 4.1), the total sample size was much lower than expected.

### 2.3.2 Characteristics of the Study Sample

Exhibit 2-2 shows distributions of the treatment and control group members across a series of characteristics. The  $p$ -values in the last column test the hypothesis that there are no systematic differences between the groups for each characteristic.<sup>17</sup> As shown, treatment and control group members were very similar in most characteristics. For the two characteristics with statistically significant differences, they most likely occurred by chance: Treatment group members were more likely to be Hispanic than were control group members, and control group members were more likely to have household incomes of \$30,000 or more. In conducting impact analyses, the research team controlled for any bias resulting from these and other differences by using baseline values as covariates to adjust for chance differences (described in the Impact Estimation section below). There were no statistically significant differences in age, gender, baseline education, receipt of means-tested benefits, or baseline work hours.

Overall, sample members had a relatively wide range of incomes; approximately one-quarter had annual household incomes of less than \$15,000; about 45 percent of the sample had annual household incomes of \$30,000 or higher. About one-third received benefits from the Supplemental Nutrition Assistance Program (SNAP, formerly known as Food Stamps) or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); a similar proportion reported experiencing financial hardship in the past year. Participants were somewhat older than traditional college students, with the largest proportion falling into the 25 to 34 age range. Only one-quarter of participants were 35 or older. Almost all study participants had earned a high school degree or equivalent (97 percent). Many had prior experience with college; about half had previously enrolled, and about one-quarter had completed at least one year.

Most study participants were female, perhaps reflecting the focus on healthcare occupations. Two-thirds were non-Hispanic Whites. Most were working at the time of random assignment, with about two-thirds working at least 20 hours per week.

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<sup>17</sup> The  $p$ -value from chi-squared tests indicates the likelihood that the observed value or a larger value would occur if there was no difference between the two samples. For example, a  $p$ -value of .32 means that even if the characteristics of the members in the treatment and control groups were identical, the observed difference or a larger difference would occur 32 percent of the time if the sample was redrawn over and over.

**Exhibit 2-2. Selected Characteristics of the Patient Care Pathway Study Sample**

Characteristic	All Study Participants	Treatment Group	Control Group	p-Value
Age				.234
20 or under	23.4%	19.9%	26.9%	
21 to 24	21.2%	23.1%	19.3%	
25 to 34	30.0%	32.3%	27.7%	
35 or older	25.4%	24.7%	26.1%	
Gender				.210
Female	84.3%	86.4%	82.3%	
Male	15.7%	13.6%	17.7%	
Race/Ethnicity				.020
Hispanic	8.8%	12.4%	5.3%	
Black Non-Hispanic	20.8%	19.8%	21.8%	
White Non-Hispanic	67.3%	64.2%	70.4%	
Other Non-Hispanic	6.4%	7.8%	4.9%	
Current Education				.198
Less Than a High School Degree	3.0%	4.8%	1.2%	
High School or Equivalent	44.4%	44.8%	43.9%	
Less Than One Year of College	24.8%	24.4%	25.2%	
One or More Years of College	21.6%	20.4%	22.8%	
Associate's Degree or Higher	6.3%	5.6%	6.9%	
Income				.044
Less than \$15,000	25.6%	27.6%	23.5%	
\$15,000-\$29,999	29.9%	33.5%	26.1%	
\$30,000 or More	44.6%	38.9%	50.4%	
Mean	\$33,165	\$31,694	\$34,694	.285
Public Assistance/Hardship Past 12 Months				
Received WIC or SNAP	35.6%	32.9%	38.2%	.205
Received Public Assistance or Welfare	4.4%	5.1%	3.7%	.593
Reported Financial Hardship	34.3%	35.1%	33.2%	.635
Current Work Hours				.941
0	27.9%	27.4%	28.5%	
1 to 19	11.5%	11.7%	11.4%	
20 to 34	32.6%	31.9%	33.3%	
35 or more	27.9%	29.0%	26.8%	
Expected Work Hours in Next Few Months				.207
0	18.3%	16.4%	20.3%	
1 to 19	15.1%	18.1%	12.1%	
20 to 34	47.4%	47.8%	47.0%	
35 or more	19.2%	17.7%	20.7%	

SOURCE: PACE Basic Information Form

SNAP is Supplemental Nutrition Assistance Program. WIC is Special Supplemental Nutrition Program for Women, Infants, and Children.

NOTE: The appendices provide a fuller set of baseline characteristics, also confirming that random assignment generated well-balanced treatment and control groups. Some percentages for characteristics do not add up to 100.0 percent due to rounding. "Public Assistance/Hardship in Past 12 Months" does not because the categories are not mutually exclusive nor exhaustive.

### 2.3.3 Analysis Plan for the Impact Study

Prior to estimating Patient Care Pathway impacts, the research team published an analysis plan specifying key hypotheses and outcome measures (see Abt Associates 2015). The team subsequently assessed data quality, refined the outcomes planned for Madison College, and publicly registered them on the What Works Clearinghouse<sup>18</sup> and the Open Science Framework<sup>19</sup> websites. The purpose of the analysis plan and registration was to guide the work of the research team and publicly commit to particular hypotheses and an estimation approach, which aligns with ACF's commitment to promote rigor, relevance, transparency, independence, and ethics in the conduct of evaluations.<sup>20</sup>

#### Hypothesis Testing

The PACE analysis plan organized and limited the number of statistical tests conducted. Like most social policy evaluations, the nine PACE studies target an array of different outcomes. If the evaluation did not take into account multiple hypothesis tests, a potentially large number of the tests could reach conventional levels of statistical significance by chance, even if there were no effect on any outcome. This possibility is known as the problem of “multiple comparisons.” To address it, the research team established three categories of hypotheses:

- **Confirmatory tests** involve outcomes most critical to judging whether the program seems to be on track—that is, producing the results expected at a given follow-up duration. Because of the relatively small sample sizes in the PACE studies, the team limited such tests to one per program in the early impact report (at 18 months after randomization) and two tests (each in a different domain) in each subsequent report (at three and six years after randomization). The team selected outcomes under the “Main Outcomes” category in the program’s theory of change (see Exhibit 2-1).
- **Secondary hypotheses** involve a set of additional indicators consistent with expected effects within the period covered by the study report. Each confirmatory and secondary hypothesis has an expected direction of change, an increase or decrease in that outcome. Therefore, the research team tests each confirmatory and secondary hypothesis for significance only in the specified direction, ignoring possible effects in the other direction, by applying one-tailed tests of statistical significance.

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<sup>18</sup> The analysis plan was posted to the What Works Clearinghouse (WWC) online registry of randomized control trials (RCT) on May 20, 2016, as were the Madison College outcomes. In September 2016, under the terms of a grant from the Institute of Education Sciences, the RCT registry information was removed from the WWC website and transferred to the Society for Research on Educational Effectiveness (SREE). SREE plans to re-launch the registry in late 2018, at which time the analysis plan will be available in a searchable online database. The analysis plan is on the ACF website: <http://www.acf.hhs.gov/opre/resource/pathways-for-advancing-careers-and-education-supplement-evaluation-design-impact-analysis-plan>.

<sup>19</sup> <https://osf.io/q5weg/>.

<sup>20</sup> See <https://www.acf.hhs.gov/opre/resource/acf-evaluation-policy>.

- **Exploratory hypotheses** cover an additional set of possible effects whose direction and timing are less certain. Accordingly, the research team applies two-tailed tests to these hypotheses.

Chapter 5 identifies the specific hypotheses in each category tested for the Patient Care Pathway program.

### Impact Estimation

Random assignment ensures that on average, samples of treatment and control group members will have similar characteristics at the outset and that measured differences in subsequent outcomes provide unbiased estimates of program impacts. To address any effects on point estimates of chance differences arising from random assignment, analysts typically estimate impacts using a procedure that compensates for chance differences in measured baseline characteristics. Such procedures also help to increase the precision of estimates.

The approach applied in PACE involves, first, estimating a statistical model relating each outcome to baseline variables for the control group sample. Next, the procedure applies this model to calculate predicted values for each treatment and control group member. In the last step, the approach calculates average differences between actual and predicted values in both groups and differences in the two averages to provide the impact estimate. Appendix B provides a detailed description of this method.<sup>21</sup>

The research team estimated this approach both for continuous outcomes (e.g., total credits earned) and for binary outcomes (e.g., yes/no questions). For survey-reported outcomes, weights were used to average outcomes. Additional details can be found in the technical appendices.

Formally, estimation uses the following equation:

$$\hat{\delta} = \frac{1}{n_T} \sum_i T_i (Y_i - \hat{Y}_i) - \frac{1}{n_C} \sum_i (1 - T_i) (Y_i - \hat{Y}_i)$$

where  $\hat{\delta}$  is the estimated impact of being in the treatment group (whether or not the student attended the program or used any of the offered services);  $Y$  is the observed outcome of interest (e.g., credits);  $\hat{Y}$  is a prediction of  $Y$  based on baseline variables measured at random assignment;  $T$  is an indicator of treatment status (which is set equal to 1 if the student is assigned to the treatment group and 0 if the student is assigned to the control group);  $n_T$  and

<sup>21</sup> As explained in Appendix B, the approach is a variant on the traditional regression-adjustment methods used in impact analyses. The latter typically involves linear regression of each outcome on an indicator of treatment status and a series of baseline variables. In the traditional approach, the coefficient on the treatment indicator provides the regression-adjusted impact estimate.

$n_c$  are the respective sample sizes in the treatment and control groups; and the subscript  $i$  indexes individual students.

#### 2.3.4 Analysis Plan for the Implementation Study

The PACE evaluation's implementation study relies on both qualitative and quantitative analyses, as well as a broad variety of data sources. Key analyses include the following:

- **Descriptive.** Describing each program's design and context and developing its theory of change relied primarily on review of program materials (e.g., internal flowcharts and documentation developed by Madison College); in-person discussions with program staff and college leadership during two rounds of site visits; and biweekly or monthly calls between the research team and the program during the random assignment period.
- **Quantitative.** Using college records, a quantitative analysis of the proportion of Patient Care Pathway students who reached major program milestones served to systematically document their experience in the program. Additionally, an analysis of college records and follow-up surveys of treatment and control group members determined the difference in receipt of training, advising, and other services.
- **Fidelity.** The quantitative analysis of how and the extent to which Patient Care Pathway students moved through the program also enabled the comparison of the actual delivery of the program with its design. This involved examining at what level students entered the program, the proportion that completed or failed to complete an academy, and the extent to which students enrolled in other training, such as PCA2 or a healthcare diploma or degree program. To answer the question of whether program delivery changed over time, the research team asked program staff about internal or external obstacles and how staff addressed them.
- **Service differences.** Because the random assignment design of the impact study ensures that any effects of the program result from the different experiences of treatment and control group members, the implementation study documented the difference in services the two groups received. This is particularly important for the PACE evaluation, as the control group is not barred from receiving similar services to the study's treatment group (i.e., for the Patient Care Pathway program, Madison College support services and courses outside of the program were open to both treatment and control group members).

## 2.4 Data Sources

The PACE evaluation's implementation and impact studies use a variety of data sources.

**Baseline surveys.** Prior to random assignment into the evaluation, program applicants completed two baseline surveys: The Basic Information Form (BIF) collected demographic and economic information. The Self-Administered Questionnaire (SAQ) measured a variety of attitudes, beliefs, and psycho-social dispositions, as well as more-sensitive personal characteristics such as financial security and criminal background.

**Follow-up survey.** The research team sought to survey all PACE study participants starting at 15 months after random assignment. On average, participants completed surveys 18 months after random assignment. The survey asked questions on participants' training and service receipt, postsecondary attainment, employment, income, debt, and participation in income support programs. It used a mixed-mode approach, conducted initially by telephone and then in person for study participants not reached by telephone. The Patient Care Pathway study completed surveys with 181 treatment and 173 control group members, yielding response rates of 72 percent and 69 percent, respectively.<sup>22</sup>

**Administrative records.** The research team used college administrative records both to describe the experience of treatment group members in their program and to estimate program effects. For the Patient Care Pathway study, the team used Madison College's records to measure program and control group members' participation in education and training, their admission into one-year diploma and two-year degree programs, and their receipt of credits and credentials.

**National Student Clearinghouse (NSC).** The NSC is a national repository of information that captures the vast majority of college enrollments at public and private nonprofit institutions. The research team used NSC data to impute outcomes for study participants who attended colleges other than Madison College.

**Site visits and monitoring calls.** For the implementation study, the research team conducted two rounds of site visits. The first visit, in April 2012, three months after random assignment began, documented the Patient Care Pathway program's theory of change and early implementation of key components (e.g., academies and advising) and assessed implementation of evaluation procedures. The second visit, in April 2014, documented any modifications to program operations or the provision of services, as well as implementation challenges and plans for sustaining the program beyond the study period. During both visits, the research team interviewed college leadership; program managers; staff involved in evaluation activities (e.g., recruitment, intake, random assignment); instructors; and advisors.

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<sup>22</sup> See Appendix D for response bias analyses.

In addition to these visits, the research team had regular conference calls with program staff during the random assignment period to discuss program updates, recruitment activities, intake and random assignment processes and any challenges, engagement in the program by treatment group members, and staffing changes.

**Instructor survey.** The research team administered an online survey to program instructors to collect information on the type and intensity of services staff members provided to students. The survey also collected information on staff background and qualifications, staff development activities, service philosophy, staff morale, and perceived effectiveness of the program. All nine of the Patient Care Pathway instructors completed the survey, administered in April 2014.

**Program documents.** The research team obtained and reviewed program documents, including assessment tools, marketing materials, academic planning tools, course syllabi and worksheets, orientation handouts, and healthcare program admission requirements.

## 3. Patient Care Pathway Program Context, Design, and Administration

Understanding the context in which a program such as Patient Care Pathway operates generally, and its local context specifically, provides useful background on the forces shaping program design and implementation. This chapter begins with a description of local context during the time the program operated (2011 to 2014). It then describes the design of the three Patient Care Pathway academies and the program supports. Additional details about program administration follow, including the division of responsibility for service provision and implementation of new program components.

### 3.1 Local Context

Characteristics of the local environment important to evaluating the Patient Care Pathway program's implementation and impacts are the demand for the program and the institutional context in which it was designed and implemented. Both contextual factors are described below.

#### 3.1.1 Demand for the Patient Care Pathway Program

Assessing demand for the program involved understanding both the number of potential applicants and the local demand for workers with the healthcare training Madison College provided. For the former, college staff focused internally—that is, on students who applied for a healthcare diploma or degree program but failed to obtain the Compass assessment scores in reading, writing, and math required to enroll. Staff reported that the college's healthcare programs denied admission to 1,120 applicants in 2011 alone, and those denied thus were potential candidates for the Patient Care Pathway program. Over the planned two-year study enrollment period, that would translate into a demand for more than 2,000 program seats.

Regarding local demand for workers, the kinds of healthcare occupations for which Madison College provides training accounted for more than eight percent of jobs in the local economy in 2013, similar to the proportion nationally (Bureau of Labor Statistics 2014). In Madison, "Healthcare Practitioners and Technical" occupations accounted for 5.9 percent of jobs and "Healthcare Support" occupations for 2.3 percent (Bureau of Labor Statistics 2014).<sup>23</sup> For Dane County (which includes Madison), the Wisconsin Department of Workforce Development

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<sup>23</sup> The Healthcare Practitioners and Technical category includes physicians (e.g., internists, surgeons, and obstetricians), nurses (e.g., registered, midwives, nurse practitioners, LPNs, and LVNs), dietitians and nutritionists, pharmacists, physical therapists, medical and clinical laboratory technicians, and medical records and health information technicians, among others. Healthcare Support includes home health aides, nursing assistants, orderlies, occupational therapy assistants and aides, medical assistants, and phlebotomists, among others.

(2015) projects that over the period 2012 to 2022, employment in “Healthcare Practitioner” occupations will increase by 19 percent and in “Healthcare Support” by 18 percent.

### 3.1.2 Adaptation of Existing Bridge Programs

Madison College is the primary education and training provider in the region for students interested in pursuing an associate’s degree, technical diploma, or certificate in the healthcare field. The college also has extensive experience operating bridge programs, including several adapted for the Patient Care Pathway program.

**Patient Care Academy / PCA1.** In 2010, Madison College established the Center for Adult Learning (CAL) in partnership with the local Workforce Investment Board (WIB) to quickly train dislocated workers for reemployment. Madison College and the WIB developed accelerated academies focused on a variety of occupations, including healthcare. The Patient Care Academy (later called PCA1 as part of the Patient Care Pathway program) was originally a WIB-funded academy to train workers for administrative positions that required medical knowledge. The Patient Care Academy included two Madison College healthcare occupations courses, Body Structure & Function and Medical Terminology, as well as basic skills courses so that workers whose Compass scores were too low to meet healthcare program admission requirements could avoid a lengthy period of remediation, quickly complete training, and look for employment. The Patient Care Academy operated at Madison College for two years prior to becoming PCA1 as part of the Patient Care Pathway program.

CAL’s programming shifted over time from serving dislocated workers to including accelerated learning and innovative program delivery methods for nontraditional students more broadly. CAL was the original department to operate the Patient Care Pathway program, prior to the School of Online and Accelerated Learning (SOAL) taking over much of CAL’s programming midway through the PACE study period (discussed further in Section 3.3 below).

**General Chemistry Bridge / PCA2.** Originally called the General Chemistry Bridge, PCA2 also ran at Madison College for a few semesters prior to becoming part of the Patient Care Pathway program for the PACE evaluation. A Community Based Job Training grant funded development of the semester-long bridge. The goal was to help students with low Compass scores complete Chemistry, which is a prerequisite course for several degree programs in the college. The General Chemistry Bridge also aimed to condense the remedial path by pairing Chemistry with a basic skills math course contextualized for chemistry. Although the bridge initially was not healthcare focused, staff indicated that a majority of the students who enrolled in the bridge were interested in pursuing healthcare degrees. Encouraged by positive findings from a small descriptive study by the Center on Wisconsin Strategy (COWS 2009), faculty believed that the basic bridge program design was strong enough to warrant extending it for the PACE evaluation.

**CNA with Support / Patient Care Nursing Assistant (PCNA).** Prior to PACE, Madison College’s adult basic education department (the School of Academic Advancement) ran a program called CNA with Support. CNA with Support was part of the college’s ongoing programming (not grant funded) and targeted students whose basic skills were too low to enroll in the college’s traditional Certified Nursing Assistant program.

Though Madison College staff noted that both the WIB-funded Patient Care Academy and the General Chemistry Bridge were promising, fluctuations in grant funding made it challenging for the college to operate both programs at the same time or to scale up either program to serve additional students as would be needed for PACE. Within this context, the PACE evaluation and the additional grant funding associated with the evaluation from OSF and the Joyce Foundation provided an opportunity for Madison College to sustain its healthcare bridges and formalize them into one program.

### 3.2 Program Design

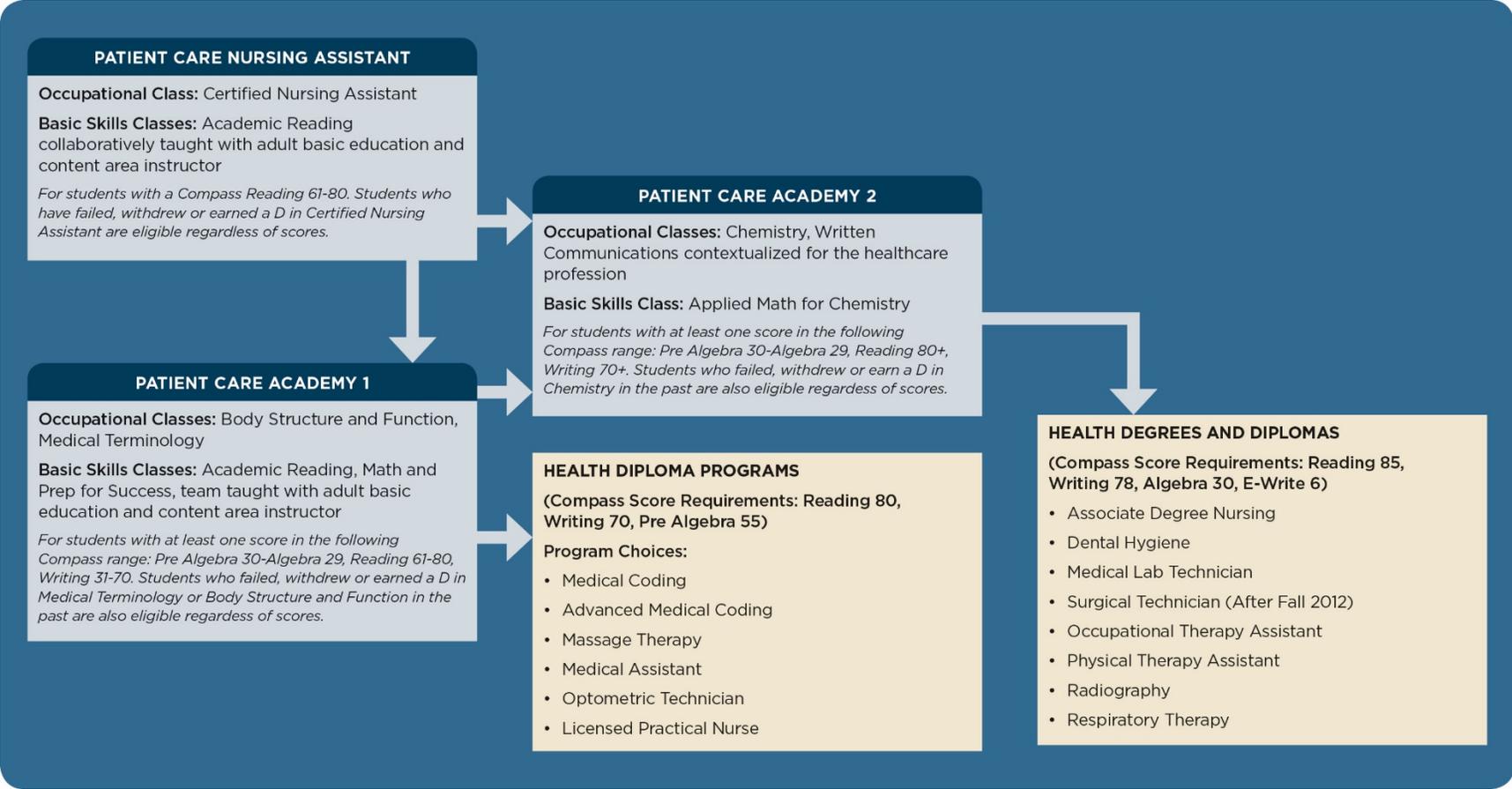
The Patient Care Pathway program linked the Patient Care Academy (renamed “PCA1”) and General Chemistry Bridge (renamed “PCA2”)—and later and briefly, CNA with Support (renamed “PCNA”)—to provide academic preparation for and to accelerate entry into Madison College’s one- and two-year healthcare programs. Once the academies were part of the Patient Care Pathway program, the program designers adapted them for students with varying skill levels and academic and career aspirations. Madison College offered the program at the Madison campus and at two of its regional campuses, Reedsburg and Fort Atkinson.

Exhibit 3-1 illustrates the eligibility criteria and course composition of each academy. The exhibit further shows that all three academies had a path to one of Madison College’s one- or two-year healthcare programs, which this report refers to as destination programs. Where a student started in the program depended on his or her academic aspirations (i.e., healthcare diploma or degree program) and skills level (as assessed by the Compass in writing, reading, and math).<sup>24</sup>

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<sup>24</sup> For more about Patient Care Pathway program components and curriculum, refer to *PACE Career Pathways Program Profile: Madison Area Technical College Patient Care Pathway Program* (Cook, Gardiner, and Martinson 2013), accessible at [http://www.acf.hhs.gov/sites/default/files/opre/pace\\_final\\_report\\_madison\\_county\\_9\\_2\\_2015\\_b508.pdf](http://www.acf.hhs.gov/sites/default/files/opre/pace_final_report_madison_county_9_2_2015_b508.pdf).

Exhibit 3-1. Patient Care Pathway Program Model



### 3.2.1 Patient Care Pathway Academies

The Patient Care Pathway academies were each one semester long and packaged occupational courses and basic skills courses contextualized with relevant occupational content. Though the basic skills and occupational content were delivered separately, students in each academy took all of the courses together as a cohort and instructors worked collaboratively to develop the curriculum and communicate about student progress throughout the semester.<sup>25</sup>

#### **Patient Care Academy 1**

PCA1 targeted students interested in a one-year health diploma whose Compass scores were too low to be admitted directly to their program of choice. To be eligible for PCA1, students' scores had to be within designated math, reading, and writing ranges comparable to a level between eighth and 12<sup>th</sup> grade.<sup>26</sup> PCA1 was also the starting point for students interested in a two-year degree program but did not have the required basic skills to be eligible for PCA2. After completing PCA1, students could enroll in a one-year health diploma program or in PCA2. Madison College staff expected that about half of PCA1 completers would continue on to PCA2

The curriculum of the Patient Care academy did not change when it became PCA1 and part of the Patient Care Pathway program. Two occupational courses, Body Structure & Function and Medical Terminology, provided students with an introduction to fundamentals in healthcare. The basic skills and support classes included a lab that provided unstructured time for the health instructor to answer questions or review material; remedial education courses in math and reading; and a student success course that covered a range of non-academic topics including study skills, time management, computer skills, financial advising, and strategies for navigating college.

After successfully completing PCA1, students earned six credits toward a healthcare diploma, which requires between 19 and 33 credits (at least another semester to one year of coursework, depending on the length of the program waitlist and the student's course load). PCA1 completers had to retake the Compass and receive qualifying scores to be eligible to enroll in any of the college's healthcare diploma programs.

#### **Patient Care Academy 2**

When they incorporated what had been the General Chemistry Bridge as part of the Patient Care Pathway program, the program designers restricted PCA2 to students interested in

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<sup>25</sup> Students in the academies took all courses together as a cohort. The exception was PCA2 students who had already taken Written Communications; they could take another, non-Patient Care Pathway course in its place.

<sup>26</sup> To meet PCA1 eligibility requirements, students were required to have at least one score in the Compass range of Pre-Algebra 30–Algebra 29, Reading 61–80, or Writing 31–70, with no scores below the range. The full list of eligibility criteria is shown in Appendix A.

healthcare programs in order to clearly define the program's focus and allow students to complete PCA1 and PCA2 sequentially. PCA2 targeted students interested in pursuing a two-year associate's degree in healthcare or the one-year Surgical Technician program<sup>27</sup> whose Compass scores were too low to be admitted directly into those programs, but were high enough to test out of PCA1. PCA2 also specified Compass math, reading, and writing score ranges for eligibility. The math range was comparable to a ninth-grade level; the reading and writing ranges were comparable to a 12<sup>th</sup>-grade level.<sup>28</sup>

In adapting the bridge into PCA2, Madison College added the Written Communications course and contextualized it for healthcare.<sup>29</sup> It added Written Communications for two reasons. First, in order to receive financial aid from the college, a student had to be enrolled in a minimum number of credit-bearing courses. Adding Written Communications to PCA2 meant that students would be enrolled in enough credit-bearing courses to receive financial aid without having to take additional courses outside of PCA2. Second, Written Communications was a required course for all two-year healthcare programs. PCA2 students who had already completed Written Communications could substitute another credit-bearing course. PCA2 completers earned seven credits toward a healthcare degree, which requires between 60 and 70 credits, or generally at least another two years of coursework, depending on waitlists and students' course load.

During the first two semesters that PCA2 operated as part of the PACE study, students who successfully completed PCA2 automatically qualified to enroll in any of the college's healthcare degree programs.<sup>30</sup> However, beginning in May 2013, Madison College changed the admission requirements for two-year degree programs to require that all students take and pass the Test of Essential Academic Skills (TEAS<sup>®</sup>) assessment.<sup>31</sup> Previously, only students in the Associate's Degree in Nursing program had to take the TEAS, and it was required only after nursing students had completed all of their general education requirements.

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<sup>27</sup> The Surgical Technician program is a one-year diploma, but it is most appropriate for those who complete PCA2 because Chemistry is a prerequisite.

<sup>28</sup> To meet PCA2 eligibility requirements, students were required to have at least one score in the Compass range of Pre-Algebra 30–Algebra 29, Reading 80+, or Writing 70+, with no scores below the range. The full list of eligibility criteria is shown in Appendix A.

<sup>29</sup> The non-credit math basic skills course in PCA2—Applied Math for Chemistry—was not contextualized for healthcare, because it was designed specifically to support the Chemistry course.

<sup>30</sup> In addition to Chemistry, some of the two-year healthcare programs also had other coursework prerequisites such as Biology or Geometry. PCA2 completers would also have to complete any additional prerequisites in order to be admitted to such programs.

<sup>31</sup> After the study period, in January 2017, the School of Health Education's nursing program replaced the TEAS for admission with the Health Education Systems Incorporated (HESI) exam. Other two-year healthcare programs at Madison College are expected to replace the TEAS with the HESI by late 2018.

### **Patient Care Nursing Assistant**

The Patient Care Pathway program added PCNA in 2013 in an attempt to bolster the study sample size (discussed further in Chapter 4). The content of the existing CNA with Support program was unchanged. PCNA combined a credit-bearing Certified Nursing Assistant course with a support class that provided instruction in reading, college success, and writing contextualized for the CNA course. PCNA students also completed a four-week clinical assignment in a local healthcare facility. Students who successfully completed PCNA received a certificate that allowed them to sit for Wisconsin's Nurse Aide licensing exam.

#### **3.2.2 Patient Care Pathway Advisors**

For the PACE evaluation, the Patient Care Pathway program incorporated a new program support—dedicated advisors. The advisors counseled students on a wide range of academic and non-academic topics, including potential barriers to success, educational and career goals, academic planning and course requirements, instructional supports, financial aid, and other life issues. The program had two advisors—except for the final semester of program operation, where there was just one advisor—each with a caseload of about 60 students.

**One-on-one advising.** Unlike traditional advising, where students seek out the services, the goal of Patient Care Pathway advising was to proactively address students' needs by encouraging them to meet one-on-one with the advisor at least three times during the semester, and more frequently if needed. As designed, advisors scheduled the three advising sessions to occur around the beginning, middle, and end of the semester. The student and advisor discussed career and academic goals and worked together to develop an academic plan, laying out planned coursework in future semesters leading to a healthcare diploma or degree. The advisor also monitored the student's academic performance and discussed any problems he or she might have with the Patient Care Pathway program courses. The advisor coordinated with the instructors to monitor the student's class performance and coordinate instructional supports, such as tutoring, or other, non-academic supports as needed. Toward the end of the semester, the advisor would help the student select and register for courses for the following semester.

Patient Care Pathway advisors also worked with students to identify potential non-academic barriers to completion and resource gaps. To identify personal barriers, advisors developed an assessment that asked the student to report long-term academic and career goals; current employment status and schedule; financial aid status; other coursework being taken; challenges such as lack of childcare, difficulty paying bills, lack of housing; and criminal background. The program intended to administer the barriers assessment at the beginning of the semester, so that the advisor and student could discuss any barriers identified and potential solutions, including referrals to other service providers as needed. However, as described in Chapter 4, the advisors used the barriers assessment infrequently.

**Emergency fund.** The Patient Care Pathway program advisors could use resources from an emergency fund to help students with small, short-term financial needs. Examples might be removing a financial hold from a student’s Madison College account, car repairs, or one month’s rent. The \$10,000 emergency fund was financed by the Joyce Foundation. Staff did not advertise the emergency fund to students, but Patient Care Pathway advisors could request grants from the fund when they identified a financial obstacle.

### 3.2.3 Comparable Services

Exhibit 3-2 summarizes the difference in services available to the study’s control group and treatment group members at Madison College. The degree to which comparable educational opportunities are available to the control group is a contextual factor relevant to the PACE evaluation’s random assignment design. Programs have the greatest potential to produce impacts when they offer services distinguishable from services available elsewhere at the institution or in the community. Because Madison College is the only community college provider in the local area, and most control group members interested in healthcare programs are likely to pursue education and training there, this comparison focuses on comparable services available at the college (rather than in the community more broadly).

**Exhibit 3-2. Comparison of Career Pathways Program Components Available to PACE Control Group versus Treatment Group Members at Madison College**

Career Pathway Component	Control and Treatment Group (Existing Services at Madison College)	Treatment Group Only (Additional Services in Patient Care Pathway Program)
Assessment	<ul style="list-style-type: none"> <li>Compass testing at Madison College</li> </ul>	<ul style="list-style-type: none"> <li>Assessment of non-academic barriers to program participation and success</li> </ul>
Training and Education	<ul style="list-style-type: none"> <li>Non-contextualized basic skills courses (developmental education)</li> </ul>	<ul style="list-style-type: none"> <li>One-semester academies geared toward healthcare program admission:                             <ul style="list-style-type: none"> <li>Accelerated completion of remediation</li> <li>Basic skills courses contextualized for healthcare field or to support occupational courses</li> <li>Collaboration among basic skills and occupational course instructors</li> <li>Variety of adult learning instructional approaches</li> </ul> </li> </ul>
Supports	<ul style="list-style-type: none"> <li>Advisor available on site for assistance registering for classes after RA</li> <li>General college advising services (initiated by student)</li> <li>Tutoring (initiated by student)</li> <li>Disability resources (if eligible)</li> <li>Career and employment center</li> <li>Financial aid based on eligibility and availability (initiated by student)</li> </ul>	<ul style="list-style-type: none"> <li>Advising from a dedicated Patient Care Pathway advisor (initiated by advisor):                             <ul style="list-style-type: none"> <li>Personal and academic advising and assistance applying for financial aid</li> <li>Minimum of three advising sessions per semester</li> <li>Coordination between advisor and instructors</li> </ul> </li> <li>Instructional supports (tutoring arranged by advisor; supplemental chemistry instructor; test-prep workshops)</li> <li>Emergency fund for small, short-term financial needs</li> <li>Follow-up support after program completion</li> </ul>

SOURCE: Program documents and site visits.

Students in the control group could piece together a similar package of services to those available to students in the treatment group. Most students attending an intake session had already sought advising or were referred to the intake session by another staff member at the college. As part of the study intake process, Madison College also made available regular college advisors to assist control group students with registration immediately following random assignment. This was a requirement of the college Institutional Review Board, which determined that requiring control group members to make a second appointment with an advisor to register for classes would have added a step beyond the standard practices at the college and thus would have added an artificial barrier to class registration.

In addition to one-time assistance with registration, control group members could access Madison College's general advising and support services if they actively sought them out. They did not, however, have access to the Patient Care Pathway program's proactive outreach and advising to help them navigate barriers in the college and guide them to relevant personal and academic support services. Control group members could access developmental education courses but not ones paired with occupational skills.

**Assessment.** Prospective students completed the Compass academic skills assessment to determine program eligibility prior to random assignment. The Patient Care Pathway program also developed its own assessment of non-academic barriers to identify risks and challenges that could affect a treatment group member's persistence in and completion of the program.

**Training and education.** Control group members had access to the college's non-contextualized basic skills courses through traditional non-credit developmental education (which might take up to three semesters). In contrast, Patient Care Pathway program participants could complete the necessary remediation in one semester and begin earning college credits because the academies paired basic skills and occupational coursework. Both treatment and control group students could also access credit-bearing courses at the college, outside of the healthcare program, assuming they met the Compass score requirements for the course.

**Supports.** As noted above, control group members had access to an advisor immediately after random assignment to assist with class registration. The advisor did not initiate any further contact after registration. Control group members could also access existing campus support services such as advising, tutoring, and disability resources (if eligible), but they had to actively seek them out. In contrast, the Patient Care Pathway program provided treatment group students with a dedicated advisor who initiated contact with them several times during the academy, and after academy completion, to provide personal and academic advising. Similarly, the program coordinated tutoring sessions for students. Finally, though all students had access to financial aid available through the college, the Patient Care Pathway program's advisor helped its students apply for financial aid and address any barriers to getting it. The advisor also could provide its students with small, occasional amounts of direct financial assistance through the Patient Care Pathway emergency fund.

### 3.3 Program Administration

Once CAL transitioned to SOAL midway through the PACE study period, SOAL staff managed the Patient Care Pathway program, which involved collaboration with the Schools of Health Education, Arts and Sciences, and Academic Advancement. This section describes the organizational responsibilities for program management, recruitment, and staffing.

#### **Program Management**

Two key staff managed the Patient Care Pathway program—the SOAL Dean (who had been the CAL Dean at the outset of the study) and the Program Director. The Dean served as the program champion and supported the Patient Care Pathway program among leadership in the college. She oversaw the Program Director and staffing decisions but was largely removed from the day-to-day operations of the program. Both the Dean and the Program Director were heavily involved in the design and implementation of the Patient Care Pathway program, and both remained throughout the PACE study.

The Program Director oversaw daily operations, including staffing for the program, scheduling its classes, working with the college’s technology staff to electronically block students from registering online for its courses without having been randomly assigned to the treatment group, managing the program budget, and managing recruitment. The Program Director also coordinated with the research team to provide updates and data, manage and conduct random assignment, and monitor fidelity to the random assignment procedures. Finally, the Program Director served as the primary advisor for the program, as discussed in more detail below.

#### **Program Recruitment**

The Program Director not only oversaw but actively participated in recruitment efforts, with support from the other Patient Care Pathway advisors. For the evaluation, the program staff needed to both scale up enrollment in the academies and recruit twice the number of students they planned to serve in order to assign half to the control group. To assist with recruitment efforts, the program added a full-time recruiter in 2013 who worked with the program for about a year. The recruiter was responsible for developing, managing, and implementing an outreach and recruitment plan.

As shown in Exhibit 3-3, the program used a variety of methods to recruit applicants, but relied most heavily on recruiting within Madison College, such as direct outreach to students and referrals from other parts of the college.

### Exhibit 3-3. Patient Care Pathway Student Recruitment Strategies

#### Internal Recruitment

- Direct outreach (e.g., letters, calls, and emails) to students who
  - Scored in the target Compass range,
  - Applied to the healthcare program and were denied, or
  - Students who had failed occupational courses in the Patient Care Pathway academies (e.g., Chemistry, Medical Terminology)
- Presentations to pre-health advisors and staff who administered the Compass test to encourage referrals
- Patient Care Pathway staff attendance at Compass testing sessions
- Weekly Patient Care Pathway information sessions
- Presentations at Madison College's new student orientation

#### External Recruitment

- Presentations and fliers at the local Workforce Investment Board office
- Presentations to high school students
- Mail and phone calls to local employers, community organizations, and high school counselors

Though some recruitment strategies required little staff time to reach a large number of students (e.g., emails to students in certain target groups), many recruitment activities required a heavy investment of staff time. Patient Care Pathway staff regularly attended Compass testing sessions and Madison College new student orientations to make presentations about the program. Interested students then met with staff one-on-one to discuss eligibility and details of both the program and the evaluation.

#### Instruction

The courses packaged into the Patient Care Pathway academies originated in three departments at the college. Faculty in the School of Health Education and the School of Arts and Sciences taught the occupational courses. Faculty in the School of Academic Advancement taught the basic skills courses. About half of the program instructors taught full-time in the Patient Care Pathway program. Overall, according to the evaluation's instructor survey, Patient Care Pathway instructors on average devoted about 60 percent of their time to the program.

Patient Care Pathway instructors were responsible for traditional classroom activities such as providing in-class instruction, working with students one-on-one outside of class, and grading. Further, instructors were responsible for coordinating with the other academy teachers to align and adjust curricula as necessary and to monitor student performance. The program also expected instructors to collaborate with a student's advisor.

#### Advising

The Program Director was one of the advisors for the entirety of the Patient Care Pathway program's operation. During most of that period, the program had a second advisor who would advise half of the Patient Care Pathway students. For the first year of the program, the second advisor was located in SOAL, but she left her position at the college in 2013. The program replaced her with the Written Communications instructor, whose home department was in the

School of Arts and Sciences. Thus, there were two advisors for the program except for the last semester, when one advisor (the Program Director) served all students.

In addition to the role described in Section 3.2.2 above, advisors were also responsible for coordinating with program instructors to monitor student performance and determine who (advisor or instructor) would contact a student when problems arose. After students completed the Patient Care Pathway program, their advisor would continue to monitor their enrollment status (e.g., check to see if students had enrolled in healthcare program courses or general education courses) and be available for questions or problems. The advisors were also responsible for the majority of the recruitment and outreach activities, as well as for PACE evaluation activities including program intake and random assignment.

## 4. Implementation of the Patient Care Pathway Program

Prior chapters described the design of the signature components of the Patient Care Pathway program. This chapter describes how the program actually implemented training and services. It then describes patterns in how participants experienced the Patient Care Pathway program, including enrollment in and completion of the Patient Care Pathway academies. It concludes by comparing education and training and service receipt for the treatment group versus the control group.

### 4.1 Implementation of the Patient Care Pathway Program

Through interviews with program staff during two rounds of site visits and monthly calls, the research team assessed recruitment strategies, as well as the degree to which the Patient Care Pathway program's education and training and services were implemented as designed. Overall, staff implemented the program with fidelity to the design, particularly with respect to its classroom instruction. However, the program did deviate from the design in notable ways: the program operated at a smaller scale than expected due to recruitment challenges; advising was less intensive than expected; and staff added a few instructional supports over the implementation period to promote student academic success. Finally, Madison College's healthcare program admission policies created delays for Patient Care Pathway program completers to transition to and complete targeted destination programs. Key implementation study findings are described in detail below.

- *Recruitment challenges led the Patient Care Pathway program to operate at a smaller scale than expected.*

Patient Care Pathway program staff struggled to recruit enough students to meet the study's sample goals. Per PACE guidelines, program staff initially expected to recruit and randomly assign 1,000 study participants over two years. Even after extending recruitment by one semester, the program had recruited a final sample of only 500 participants. Recruitment efforts at the college's Madison campus were more successful than at the regional campuses. Recruitment was especially difficult at the Fort Atkinson campus, leading the college to end the evaluation at this location after two semesters.

Program staff identified several recruitment challenges. They were unable to reach many potential students because external partners (local employers and high schools) and advisors in other parts of the college did not refer all eligible students, possibly due to concerns that the program was relatively new and its effectiveness not established. Additionally, there were other options available to eligible students. For example, they could get the required remediation by enrolling in traditional developmental education courses, or they could shift from an occupational track that required remediation to one for which their Compass scores sufficed.

Generating interest in the program, particularly for PCA1, presented another challenge for recruitment. First, once PCA1 became part of the Patient Care Pathway program, conveying the academy's benefit to students became more difficult. Although the courses Medical Terminology and Body Structure & Function helped students build a foundation in health, not all healthcare diploma programs required them. Thus, students may not have seen the benefit of PCA1 over other credit-bearing courses in which students with low Compass scores could enroll. Second, in January 2013, Madison College announced plans to eliminate the Licensed Practical Nurse (LPN) diploma program.<sup>32</sup> Because the LPN program was one of the primary one-year diploma programs into which PCA1 laddered, PCA1 may have further lost its appeal.

In 2013, program staff attempted to increase recruitment and enrollment by adding a third academy (PCNA), hiring a dedicated recruiter, and engaging a technical assistance provider. As noted in Chapter 3, PCNA operated at the college prior to becoming part of the Patient Care Pathway program, but at a smaller scale. Program staff believed PCNA would add up to 320 participants to the evaluation's sample size over two semesters. Staff also believed PCNA was a good fit for the program: it incorporated the core career pathways components (acceleration, collaborative instruction, and advising), and it would be a first step for some students who ultimately would transition into PCA1 or PCA2 and then into a healthcare diploma or degree program. The Madison campus offered PCNA three times and the Reedsburg campus offered it once. However, PCNA had much lower than expected enrollments—just 52 students by the end of the Fall 2013 semester. Program staff eliminated PCNA from the Patient Care Pathway program after the semester ended.

The program also hired a dedicated recruiter in 2013. At the program's outset, the Program Director, advisors, and administrative support staff recruited students in addition to their other responsibilities. The recruiter was to manage and implement a recruitment plan that included building relationships with external organizations. However, as discussed above, partnerships with local employers and high schools ultimately did not yield many referrals to the program. The technical assistance provider supported recruitment by reviewing the existing Patient Care Pathway recruitment plan and helping implement a referral tracking system. The technical assistance provider helped staff to use the tracking information systematically to assess which activities were most promising and focus their recruitment efforts accordingly. Although Patient Care Pathway staff believed the recruiter and the technical assistance were helpful, neither effort translated into a large increase in study enrollment.

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<sup>32</sup> Madison College eliminated the LPN program from the Reedsburg campus after the Spring 2013 semester and from the Madison campus after the Spring 2014 semester.

- *The Patient Care Pathway program delivered training largely as designed.*

The program designers intended for specific basic skills courses in PCA1 and PCA2 to be contextualized for the healthcare field, and the program did implement that contextualized curriculum for these courses. In its instructional approaches, the goal of the Patient Care Pathway program was to emphasize active learning and use of technology to supplement in-class instruction. Many courses incorporated active learning frequently, but courses with heavy science or math content were more likely to rely on a traditional, lecture-based format.

In PCA2, Written Communications was the only course that the program designed to be contextualized for healthcare occupations. Many of its in-class exercises simulated healthcare experiences, and all writing assignments were based on scenarios that students in a healthcare job would encounter. For example, in one exercise, a student would act out a medical incident and then the other students would have 15 to 20 minutes to write an incident report on an American Medical Association form. The program did not design contextualized curricula for the Chemistry and Applied Math for Chemistry courses included in PCA2, although the Chemistry instructor used examples with connections to healthcare occupations when possible.

The PCA1 basic skills instructors used occupational course content to teach basic skills concepts. For example, the PCA1 reading course instructors used excerpts from the Medical Terminology textbook. When possible, the PCA1 math course used examples from healthcare occupations (e.g., dosages and conversions).

As was the case for PCA1, the program designed the PCNA basic skills class to help students successfully complete the occupational course (Certified Nursing Assistant). The basic skills course focused on topics such as study skills and job-related skills such as professionalism in the healthcare workplace.

The Patient Care Pathway program aimed to emphasize active learning, and many courses did so. Several Patient Care Pathway courses used small group and independent work frequently. For example, PCA1 students in Medical Terminology paired off to write a medical skit using at least 15 medical terms and then acted out the skit for the class. In PCA2, the Written Communications instructor used frequent in-class activities, as well as a version of the “flipped classroom” technique, in which students use educational technologies to learn new content outside of class and then use class time to reinforce the concepts and explore them in more depth. As much as half of class time might be used to work on writing assignments or to work individually with the instructor, as opposed to lecture.

Conversely, about half of the Patient Care Pathway courses primarily used a lecture-based approach, and they did not incorporate much active learning. Chemistry and Applied Math for Chemistry in PCA2 and the Student Success Lab and Body Structure & Function in PCA1 were the most lecture-heavy courses. These instructors used lectures out of necessity, given the nature and quantity of topics to cover, but they also incorporated other instructional

approaches such as independent work, seminar-style discussions, and group work when possible.

In keeping with the program's design, almost all of the Patient Care Pathway courses used technology to supplement in-class instruction. Instructors often used online platforms, such as Blackboard®, to post syllabi and reading assignments, allow students to submit homework online, and administer quizzes and practice tests. The PCA1 basic skills math class used more online instruction than other courses did; in addition to class time, the program required PCA1 math students to spend two hours each week working in an online program called Assessment and Learning in Knowledge Spaces (ALEKS®) to identify gaps in their knowledge so they could focus on the topics they most needed to learn.

- *Over time, the program incorporated additional instructional supports in response to identified student needs.*

During the first year of the study, the Patient Care Pathway program added two instructional supports intended to promote students' academic success: a supplemental instructor for the PCA2 Chemistry class and organized group tutoring sessions for PCA1 students. Additionally, the program added a TEAS workshop to help PCA2 students prepare for the assessment, which was implemented by Madison College in Spring 2013 and required for admission to the two-year healthcare degree programs.

In response to student difficulties with the PCA2 Chemistry class, program staff added a supplemental instructor at the Madison campus in the Spring 2013 semester, funded by the Madison College tutoring center.<sup>33</sup> The supplemental instructor attended the class, took notes to share with students with learning disabilities who needed academic accommodations, and facilitated an optional weekly review session. The supplemental instructor led the review sessions, but the discussion was student-driven. Prior to this addition, students had access to general chemistry tutoring at the college. However, students reported the general tutoring was difficult to attend because it was provided at limited times, one of which conflicted with the PCA2 Chemistry class time.

The program advisor also organized group tutoring for PCA1 students who showed a need for additional instructional support or expressed an interest in receiving it. As with the general chemistry tutoring, Madison College provides one-on-one tutoring to those who seek it. The group tutoring sessions organized by the PCA1 advisor aimed to make tutoring easily available and tailored to the content of PCA1 classes. The sessions were held at times convenient to the students; moreover, the group format enabled them to study with their cohorts.

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<sup>33</sup> The PCA2 Chemistry class in Reedsburg did not have a supplemental instructor due to lack of available resources.

Finally, PCA2 instructors designed and implemented the TEAS workshop to help PCA2 students prepare for the TEAS assessment. As described in Chapter 3, starting in the spring 2013 semester, students had to achieve a required assessment score before applying for two-year healthcare degree programs. Delivered over three evenings, the workshop focused on test-taking skills and reviewed course content. Around the same time, the School of Health Education also began offering a TEAS workshop, which control group students could access. According to staff within the School of Health Education, this workshop was largely unsuccessful in improving TEAS scores. The Patient Care Pathway program did not collect data on whether workshop attendees achieved their required scores.

- *The program's advising was less intensive than planned, though most treatment group members received advising at least once.*

Advisors reached out to students to schedule at least three advising sessions, and they visited classrooms to conduct group advising. However, the frequency of one-on-one advising sessions was less than planned for a large share of the program participants. Advisors expected to meet with Patient Care Pathway students at least three times one-on-one over the course of the semester in order to monitor progress and address needs as they occurred. Though encouraged, advising was not mandatory and the program did not impose a penalty on students who failed to meet with their advisor (e.g., the program did not provide any financial support that could be reduced).

The advisors actively reached out to each student in their caseload<sup>34</sup> to schedule one-on-one meetings at the beginning, middle, and end of each semester. If a student failed to respond, the advisor followed up by calling or emailing the student or by coming to the classroom. However, program advisors acknowledged that they were generally only persistent in trying to set up a meeting when a student had a problem, such as poor attendance or weak academic performance. The advisors coordinated with the instructors to determine which students needed advising outreach. For example, one instructor said she copied the advisor on emails sent to students with their weekly quiz scores and met with the advisor to assess student performance after each major exam.

As summarized in a later exhibit (Exhibit 4-5), most treatment group members received some academic advising services. According to the participant follow-up survey, the majority who attended any education or training stated they received academic advising at least once (70 percent). Fewer than half (45 percent) reported receiving academic advising three or more times (i.e., the recommended minimum number of advising sessions per academy). However, it

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<sup>34</sup> During the five semesters that the Patient Care Pathway program operated as part of the PACE study, the advisors' caseload averaged about 60 students who were enrolled in one of the academies. Patient Care Pathway advisors were also expected to monitor academic progress and be a resource for program completers, so the advisors' caseload size grew over the random assignment period.

is possible that some Patient Care Pathway program participants who met with an advisor three or more times are not included in the 45 percent because their advising meetings focused on topics the survey asked about separately, such as financial aid or arranging supports for work or school.

Receipt of advising lessened over the study period (not shown in the exhibit), especially with respect to higher frequencies of advising. Early program participants—that is, students who were randomly assigned and enrolled in an academy prior to June 2013—were slightly more likely than those enrolled later to report receipt of academic advising ever (71 percent versus 67 percent), but substantially more likely to report receipt of academic advising three or more times (51 percent versus 32 percent). This analysis suggests that the implementation of advising may have weakened over time. However, given that advising was voluntary for program participants, it is unclear whether this weakening was a result of the program providing less advising (e.g., growing advising caseloads or the increased focus on recruitment over time reduced the amount of time advisors could spend communicating with advisees) or participants taking up less advising (e.g., holding a less positive view of their prospects after imposition of the TEAS requirement).

Patient Care Pathway participants likely encountered program advisors in situations other than formal advising sessions. As designed, advisors delivered information to students in group settings and frequently made short in-class presentations to share any relevant announcements, such as information about financial aid deadlines, registration requirements, or TEAS testing. In the Fall 2012 semester, advisors began holding Patient Care Pathway program orientations prior to the start of classes. The purpose of the orientation was to address student unpreparedness, such as not having books, not resolving financial aid problems by the first day of class, or not clearly understanding classroom expectations.

The program had a blueprint for each of a semester's three advising sessions, with the expectation that advisors would address issues likely to arise at specific points in the semester. The advisor could alter the content of the advising sessions as appropriate to address individual student needs. The initial advising session and program orientation (when it was held) focused on financial aid, academic and non-academic barriers to school, and course requirements and expectations. A primary goal of this first session was to ensure the students secured financial aid by helping them fill out financial aid forms, explaining credit requirements for federal financial aid eligibility, and troubleshooting as needed.

The advisors also worked with students early in the semester to identify and address personal and academic barriers, though they infrequently used the non-academic barriers assessment (described in Chapter 3) for this purpose. One advisor was not aware of the assessment; another indicated a preference for informal discussion during the initial conversation with an advisee. All advisors said they connected students as needed to internal supports (e.g., bus passes) and external supports (e.g., income-based childcare assistance). The program did not

provide support services directly—aside from the emergency fund used by about 10 percent of students for small, short-term financial needs. During this first session, advisors also encouraged students to undergo a background check, to identify barriers to future employment in a healthcare occupation.<sup>35</sup> Because the background check was relatively expensive (approximately \$60), the Patient Care Pathway advisors sometimes used the emergency fund to offset the out-of-pocket expense for the students.

The second, mid-semester advising session focused on student academic performance, academic planning, and reassessment of barriers as needed. Advisors worked with students on an academic plan. Some plans mapped course requirements through the start of a desired healthcare training program, with a semester-by-semester guide to show what students needed to do to meet their goal. Other plans were shorter to prevent students from becoming overwhelmed. One advisor noted that he used the plan to have a conversation about how many courses a student should take each semester, and how long it would take for the student to reach his or her goal. The academic plan was usually limited to educational goals and only addressed career goals if the student expressed an interest. However, if the advisor identified an obvious disconnect between a student’s career goal and apparent abilities and interests, the advisor would discuss career and educational alternatives with the student. For example, an advisor encouraged one student to pursue training other than healthcare after the student expressed an aversion to working with people.

The third session at the end of the semester focused on updating the academic plan as necessary and registering for the next semester’s courses. The advisors also continued to check the registration status of Patient Care Pathway program completers at the start of each subsequent semester, until students started their destination healthcare training program. If students did not register for classes, the advisor would contact them to discuss any barriers or problems and encourage them to register.

- ***Control group members received more guidance with course selection and registration than planned.***

After the study period, the study team discovered that Patient Care Pathway program staff provided more guidance and registration assistance to control group members than planned. This guidance and assistance entailed:

- **“Course mapping” before random assignment.** During one-on-one intake sessions prior to random assignment the program manager provided detailed explanations of two potential pathways—a Patient Care Pathway program path and a control group

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<sup>35</sup> PCA1 and PCA2 did not require a background check for enrollment, but PCNA did.

path.<sup>36</sup> The study procedures called for a description of the Patient Care pathway to ensure that potential study participants would be interested in and able to attend the courses should they be assigned to the treatment group, but not a detailed description of an alternate pathway for the control group. In this “course mapping” discussion, the program manager created a written document with recommended classes for either option (the Patient Care classes if assigned to the treatment group, and recommended classes if assigned to the control option). When the program manager conducted random assignment in a one-on-one setting, she provided the student with a copy of the relevant courses listed based on group assignment. The program manager, who also served as a program advisor, did not make contact with control group members after the random assignment session or provide them with any additional advising services (e.g., determining if they registered for classes the following semester).

- **Registration support for control group members.** During the small group or one-on-one information sessions, the program manager had control group members register for classes in her presence, using the list of classes from the course mapping session as a guide, as opposed to referring control group students to a college advisor, as planned.

According to the program manager, she conducted one-on-one intake sessions with about 50 percent of the total study sample, so about half of the control group members received one-on-one guidance prior to random assignment and assistance with class registration following random assignment.<sup>37</sup> The program manager gave two reasons for providing course planning support to all potential applicants prior to random assignment. First, she felt that outlining the two options was critical to convincing potential participants of the value of the program. Since the intent of the program was to shorten the time to enroll in a health program, the program manager said that a key selling point was to lay out what the pathway would look like in absence of the program. Second, the program manager said that much of the course planning occurred because potential participants had a lot of detailed questions about the specific classes and schedule if assigned to the control group, and would be hesitant to move forward to random assignment without that information.

It is unclear whether the program manager’s guidance resulted in control group members registering for specific classes. The study team examined enrollment data for control group

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<sup>36</sup> Other staff who conducted one-on-one random assignment did not report providing detailed information about recommended courses in pathway (i.e., the PCPP or the control). Similarly, this type of course planning was not offered in the group intake sessions.

<sup>37</sup> Recruitment challenges—described earlier in this section—likely led to a greater use of one-on-one intake sessions than planned, as staff reported doing individual intake sessions more heavily as the start of each semester neared and PCPP staff attempted to fill available seats.

members in the first semester after random assignment, comparing courses control group members enrolled in with those the program manager commonly recommended. The data indicated that a small share (less than 15 percent) of control group members enrolled in the courses the program manager recommended. This suggests that any effect of the provision of guidance to control group members would have at most a small effect on impact estimates, especially given that the study population was recruited from within Madison College.

- ***Madison College healthcare program admission policies and waitlists created barriers for Patient Care Pathway program completers to transition to and complete targeted destination programs.***

One of the primary goals of the Patient Care Pathway program was to facilitate quicker admission to and enrollment in healthcare diploma and degree programs by shortening the time necessary to raise basic skills levels and meet admission requirements. However, during the study period, four factors not addressed in the program design created delays and other barriers for students' enrollment in and completion of healthcare programs: the adoption during the study period of the TEAS assessment as an admission requirement for two-year degree programs, short and infrequent application windows, lags of up to a year between application windows and program admission and start dates, and long waitlists for healthcare programs. Exhibit 4-1 summarizes each barrier and provides a hypothetical examples of how it could affect a student's ability to enroll in and complete a degree program.

**Exhibit 4-1. Madison College Barriers to Healthcare Program Admission and Completion**

Barrier	Description	Hypothetical Example of Delay
Test of Essential Academic Skills (TEAS) assessment	Partway through the study period, Madison College two-year healthcare programs began requiring that students pass the TEAS assessment prior to program admission. However, staff at the School of Health Education reported that a large share of students at Madison College failed to achieve the required TEAS scores even after multiple attempts.	Students completing PCA2 in December (starting in 2013 or later) needed to achieve required scores on the TEAS test to be accepted to a program. Those who did not had to retake the test by the September—October admissions window or wait until the following September to apply. Students that did not achieve the required score could not enter their program of choice.
Annual application window	Many two-year healthcare programs had short annual application windows which, depending on when students completed an academy, could result in a wait of up to a year before applying to a program.	A healthcare program accepts applications for a six-week period in the Fall (September and October). Students enrolled in PCA2 in the fall would complete the academy in December, but could not submit an application until the following September when the program begins accepting applications.

Barrier	Description	Hypothetical Example of Delay
Application window one year in advance of enrollment date	Some healthcare programs required that students apply one year in advance of the program start date. Even after successfully applying for and being notified of admission, a student's actual program start date might not occur until the following year.	Students completing PCA2 in December 2013 could apply for a program in September 2014 (as described in example above). If accepted, the program start date for those students would not be until September 2015 (or later if there is a program waitlist – see below).
Long waitlists for healthcare programs	Many of Madison College's healthcare programs had one- to two-year waitlists, which delayed students' enrollment and completion of core courses once they were admitted to their destination programs. The long waitlists were a barrier to steady program progress and completion because students could not enroll in core program courses and may have had little or no coursework to complete while waiting.	As described above, students completing PCA2 in December 2013 can apply for a program in September 2014. If accepted, the program start date for those students would be September 2015. However, if the program had a one-year waitlist, that student would not be eligible to enroll in program courses until September 2016, effectively resulting in a wait of more than two years after academy completion.

Patient Care Pathway program designers expected students to gain admission to one- or two-year destination healthcare programs more quickly than they would have absent the program by shortening the period of remediation. However, the program design did not address four institutional policies that affected admission into and completion of healthcare programs.<sup>38</sup>

First, as described above, Madison College began requiring students interested in two-year healthcare degree programs to achieve a specific score on the TEAS assessment. The assessment was implemented two semesters after the start of the study. A key feature of the PCA2 design was automatic qualification to enroll in any healthcare degree programs without having to retest. This changed with adoption of the TEAS. Study participants randomly assigned for the spring 2013 semester and beyond—68 percent of the sample—needed to achieve a required score on the TEAS before applying to a degree program.<sup>39</sup>

Program staff were concerned that the TEAS would be a barrier to at least some PCA2 students' enrollment in two-year healthcare programs because students had to go through the extra steps of preparing for the TEAS, paying the testing fee, and scheduling a time to take the test.

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<sup>38</sup> Needing to complete prerequisites not satisfied through the Patient Care Pathway program before applying also may have delayed some students' admission to healthcare programs. For example, some healthcare programs had a biology prerequisite that most applicants fulfilled with credits from high school; those who did not take biology in high school had to complete a college biology course. Staff reported that this occurred occasionally, but was not a major reason for delayed admission.

<sup>39</sup> Study participants randomly assigned earlier may also have been affected by the TEAS requirement, however, if they applied for a two-year degree program after May 2013. For example, PCA1 applicants randomly assigned in fall 2012 who then progressed to and completed PCA2 would be subject to the TEAS requirement, as would control group members who completed more than one semester of remediation and degree program prerequisites before applying to a two-year healthcare program.

Program staff were also worried that students would struggle to pass the TEAS, because many students in the Patient Care Pathway program had a history of poor test-taking skills. According to School of Health Education staff, the TEAS was a barrier to program admission and enrollment for many students (including those not in the Patient Care Pathways program) because a large share failed to achieve the required TEAS scores even after multiple attempts. As described above, the Patient Care Pathway program sought to help student prepare for the TEAS exam by offering a TEAS workshop, but the program did not have data on whether it was successful.

Starting in January 2017, after program participants had completed PCA2, the college began phasing out the TEAS and replaced it with the Health Education Systems Incorporated (HESI) exam. The Associate's Degree in Nursing program was the first to replace the TEAS with the HESI exam, and other two-year healthcare programs at Madison College are expected to use the HESI by late 2018. Staff within the School of Health Education noted that nearly all students who were initially unable to pass the HESI were able to do so on their second attempt because students were notified of their specific areas of deficiency following their first attempt and received a workbook to help them improve in those areas. Although the HESI was introduced after the 18-month follow-up period covered in this report, it may affect some Patient Care Pathway students over a longer follow-up period. Because the HESI appears to be less of a barrier than the TEAS, it may become easier for students to gain admission to a two-year healthcare program after the HESI is implemented.

Three other factors affecting enrollment in and completion of healthcare degree programs were not changes that occurred during the PACE study period but long-standing issues that were not factored into the Patient Care Pathway program design (see Exhibit 4-2 for an illustrative timeline showing how these barriers could collectively lead to significant delays). For one, many of the two-year healthcare programs admitted new students only once per academic year during a short application window. Depending on when a Patient Care Pathway program student completed an academy, this application cycle could add as much as an academic year of wait time before the student could apply for and gain admission to a healthcare program. For example, a student completing PCA2 in a fall semester (ending in December) might have to wait until the following fall (September – October) to apply.

Additionally, some healthcare programs required that students apply one year in advance of the program start date. As described in the example above, a Fall 2013 PCA2 completer might not be able to apply to a healthcare program until Fall 2014. However, even once notified of program admission in Fall 2014, the student would not be eligible to start program courses until Fall 2015—a year after notification of program admission—delaying the students' admission date (as reflected in College records) and enrollment in and completion of core program courses.

Finally, students often faced long program waitlists even after successfully gaining admission. Long waitlists delayed student enrollment in core courses, which slowed their progress toward diploma or degree completion. Students admitted to a one-year program averaged a one-year wait to start its core courses; students admitted to a two-year program often had a two-year or more wait before they could enroll in core courses. Students on a waitlist and students not yet admitted to a program could enroll in required general education courses, such as Communications or Psychology, but not in core program courses such as Introduction to Radiography or Nursing Fundamentals. Depending on how many general education credits students had earned at the time they were waitlisted, they may have had few, if any, courses in which to enroll. One of the program advisors expressed concern that students with no coursework to occupy them would lose interest in the program while they waited to enroll in core courses. Advisors worked with students to plan for time spent on waitlists to the extent possible, but as described earlier, many students did not attend the three one-on-one advising sessions the program’s design called for.

Exhibit 4-2 provides a hypothetical timeline for a student who completes PCA2 and then faces several of these barriers to program entry and completion. As shown in the timeline, a student who completed PCA2 in December 2013 may apply to a two-year healthcare program with an annual application window between September and October 2014. Prior to application, the student would need to take the TEAS assessment and achieve the scores required by the healthcare program. Assuming the student achieves the needed TEAS scores, he or she could be notified of their acceptance to the program by November 2014, 11 months after PCA2 completion. However, since the program would not begin until the following Fall (September 2015), the student would be admitted for the Fall 2015 term. Furthermore, because most of the healthcare programs had one- to-two year waitlists, the student in this example would have to wait another year following the term for which the student was admitted to enroll in core program courses (September 2016 in this example –two and a half years after academy completion).

**Exhibit 4-2. Hypothetical Program Enrollment Timeline for PCA2 Student**



Note: this timeline assumes that the student passed the TEAS sometime between December 2013 and September 2014.

## 4.2 Education and Training Participation Patterns

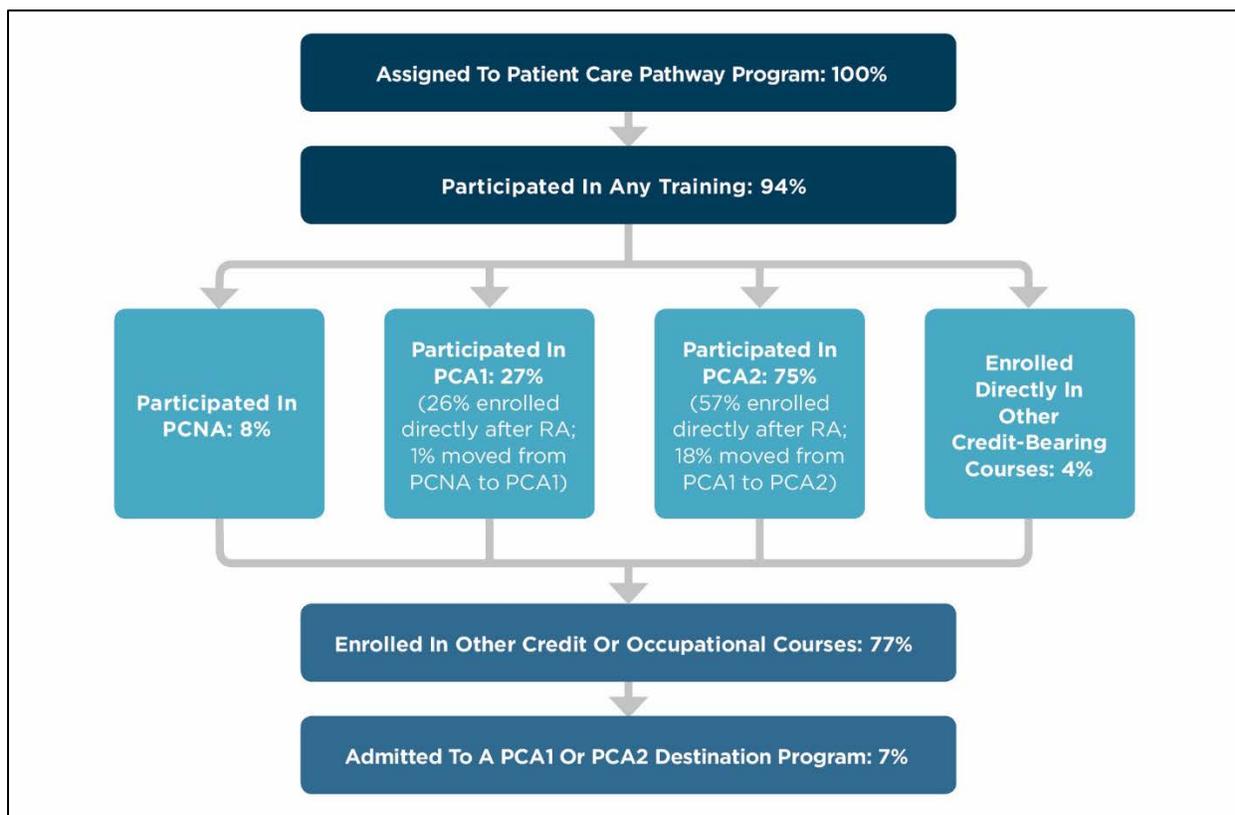
The key objective of the Patient Care Pathway program was to increase students' rates of entry into college-level healthcare programs by allowing them to pursue basic skills and occupational training simultaneously through the Patient Care Pathway academies. This section describes participant patterns for students assigned to the study's treatment group. The analysis, based on Madison College records, examines the overall level of participation and sequence of academy programs and subsequent credit courses, completion rates, healthcare program admission rates, and duration of participation over the 18-month follow-up period.

- *More than 90 percent of treatment group members participated in some type of education and training, and many progressed from the Patient Care Pathway academies to credit-bearing courses outside the academies. However, only seven percent gained admission to a Madison College destination healthcare program during the 18 months following random assignment.*

Exhibit 4-3 shows the proportion of all treatment group members who achieved key training milestones in the Patient Care Pathway program. Overall, 94 percent participated in any education and training courses at Madison College, inside or outside the program. Of all treatment group members, 91 percent attended one of the academies as their first enrollment: eight percent began with PCNA, 26 percent began with PCA1, and 57 percent began with PCA2. Another four percent began with other credit-bearing or occupational courses and did not attend an academy. Eighteen percent of treatment group members enrolled in both PCA1 and PCA2 (i.e., two-thirds of PCA1 enrollees continued to PCA2); thus, a total of 75 percent of all treatment group members participated in PCA2. Six percent of treatment group members did not enroll in any education or training at Madison College after they were randomly assigned.

Including the four percent of treatment group members who enrolled directly in other courses, 77 percent of all treatment group members participated in other courses at Madison College, most commonly after completing PCA2. The courses in which treatment group students most commonly enrolled were Anatomy & Physiology, Psychology, Sociology, and Oral & Written Communication. It is not possible to discern whether students enrolled in these courses to earn credit for a specific program of study, as many of these courses are required for several different diploma or degree programs at Madison College.

**Exhibit 4-3. Participation and Completion of Madison College’s Patient Care Pathway Program for Treatment Group Members within an 18-Month Follow-Up Period**



SOURCE: Madison College program records.

NOTES: Sample includes all 251 participants who were randomly assigned to the treatment group. Components may not sum to totals due to rounding. Percentages showing participation in the Patient Care Pathway academies do not sum to 100% because some students enrolled in multiple academies. “Other Credit or Occupational Courses” category includes credit-bearing and occupational training courses (excludes remedial and non-degree enrichment courses).

Exhibit 4-3 also shows that at the end of the 18-month follow-up period, only seven percent of all treatment group members gained admission<sup>40</sup> to one of the healthcare programs targeted by PCA1 or PCA2.<sup>41,42</sup> The Madison College data used for this analysis reflects the *academic term for which the student was admitted*, not the date on which the college made an admission

<sup>40</sup> Most of the healthcare programs at Madison College had a waitlist, ranging from one to three years. However, students were waitlisted after admission to a program, implying that wait-listing did not lengthen time to admission, but rather delayed students’ timely enrollment in and ability to earn credits in core courses.

<sup>41</sup> The programs targeted by PCA1 and PCA2 are those listed in Exhibit 3-1. In addition, the two-year Veterinary Technician program is included as a PCA2 destination program because, though not part of the School of Health Education, that program has many of the same prerequisites as the two-year healthcare programs targeted by PCA2. The list of targeted programs does not include healthcare certificate programs such as CNA or Phlebotomy.

<sup>42</sup> An analysis of this data split out into early cohorts (those randomly assigned by June 2013) and late cohorts (those randomly assigned after June 2013) showed minimal differences in participation rates between the early cohort, the late cohort, and the full cohort.

decision. In the example above (Exhibit 4-2), a student who applied to a program in September 2014, was accepted in November 2014, and was eligible to start the program in September 2015 would not appear in the data as admitted until September 2015. Three of the barriers described in Section 4.1 likely influenced the low admission numbers. First, treatment group members may have had to wait up to one year between completing a Patient Care Pathway academy and applying to a program because some programs had short, once-yearly application windows. Second, some program application windows were up to a year in advance of the actual admission date when a student might be able to enroll in core coursework. A final factor is the requirement to pass the TEAS, for those who applied to a two-year healthcare degree program in the spring 2013 semester and later. The waitlists, however, did not delay the admissions date, which still showed the term for which the student was admitted, even if he or she could not enroll in core program courses.

- *The healthcare program admission rate was low during the 18-month follow-up period, but analysis of data for a longer follow-up period showed increasing admission to healthcare programs among treatment group members.*

Exhibit 4-3 shows that only seven percent of treatment group members were admitted to a destination program within the 18-month follow-up period. Admission data for a longer follow-up period shows an increase in the proportion of students admitted to a destination program. By 30 months after random assignment, 21 percent of PCA1 and PCA2 completers were admitted to a program. By 35 months, the proportion increased to 27 percent (not shown). It is notable that even with this positive trend, only about 40 percent of students who successfully completed PCA1 or PCA2 (or both) by 18 months after random assignment gained admission to an academy destination program by 35 months.<sup>43</sup> This suggests that some admission to destination programs occurred, but substantially later and at lower rates than the theory of change implied and the research team expected. Chapter 5 provides further discussion of the pattern in admission rates over time, as well as exploratory impact estimates on admission.

- *Completion rates for PCA1 and PCA2 were high, but few academy students completed the longer-term diploma or degree programs. A majority of students were still enrolled in courses at the end of the 18-month follow-up period.*

Whereas Exhibit 4-3 showed the overall education and training participation for all treatment group members, Exhibit 4-4 depicts attendance and completion rates and average length of time in an education and training course for the subset of treatment group members who participated in education and training (i.e., the 94 percent from Exhibit 4-3). Exhibit 4-4 shows that the completion rates over the 18-month follow-up period for PCA1 and PCA2 were relatively high (81 and 78 percent, respectively) among those students who attended the academies. The completion rate for PCNA was much lower (50 percent). Each academy was one

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<sup>43</sup> That is, 27 percent of the 68 percent who completed PCA1 or PCA2 = 40 percent.

semester: on average, students attended PCA1 for 3.6 months and attended PCA2 and PCNA for 3.8 months. A large majority completed the program they attended within the 18-month follow-up period.

**Exhibit 4-4. Participation, Completion, and Average Length of Stay among Treatment Group Members with Any Participation over an 18-Month Follow-Up Period**

Participation in the Patient Care Pathway Academies <sup>a</sup>				
PCA Programs Attended	Participation Rate	Completed PCA (of those who participated)	Average Length of Time in PCA (months)	PCA Still in Progress at Follow-Up
PCA1	28%	81%	3.6	0%
PCA2	80%	78%	3.8	2%
PCNA	8%	50%	3.8	0%
Participation in Courses outside of the Patient Care Pathway Academies <sup>b</sup>				
Programs Attended	Participation Rate	Obtained credential (of those who participated)	Average Length of Time in Training (months)	Training Still in Progress at Follow-Up
Other Courses	81%	15%	8.2	71%
PCA2 and Other Courses	56%	13%	10.6	73%
PCA1 and PCA2 and Other Courses	18%	14%	10.8	76%
Participation in Any Training				
Programs Attended	Participation Rate	Completed at least one PCA or obtained credential	Average Length of Time in Training (months)	Training Still in Progress at Follow-Up
Any Enrollment	100%	77%	9.2	58%

SOURCE: Madison College program records.

NOTE: Sample size of 237, which includes all treatment group members who attended any training at Madison College.

<sup>a</sup> This panel describes participation in Patient Care Academies. “Participation Rate” is the share of all 237 treatment group members in training who enrolled in the specified academy, regardless of participation in other academies or other courses. Categories are not mutually exclusive, so components exceed 100%.

<sup>b</sup> This panel describes participation in courses outside the PCA program, regardless of participation in any academy. “Other Courses” includes credit-bearing and occupational training courses (excludes remedial and non-degree enrichment courses). Categories are not mutually exclusive, so components exceed 100%.

Exhibit 4-4 also shows that, not surprisingly, attainment of a diploma or degree within the 18-month follow-up period was low. Of those students who enrolled in any credit-bearing course outside of the Patient Care Pathway academies (81 percent of treatment group members<sup>44</sup>), only 15 percent earned a credential within the follow-up period, most commonly a Nursing Assistant diploma. More than 70 percent were still enrolled in courses at the end of the follow-up period. Because only seven percent were admitted to one of the healthcare programs

<sup>44</sup> Here, the percentage of students enrolled in any credit-bearing course outside of the Patient Care Pathway academies (81 percent) is among those who participated in any training (94 percent of treatment group students). As such, this figure is slightly higher than the 77 percent reported in Exhibit 4-3, which includes all randomly assigned treatment group members.

targeted by PCA1 and PCA2, it is likely that a large share of those still enrolled in courses at the end of the follow-up period either were enrolled in healthcare program prerequisites or general education requirements or were enrolled in core courses as part of certificate or non-healthcare diploma or degree programs.

The top panel of Exhibit 4-4 also shows that for treatment group members who attended only PCA1, PCA2, or PCNA, the length of stay at Madison College was less than four months (top three rows). However, for the participants who attended PCA2 in combination with other credit-bearing courses (56 percent) or attended PCA1, PCA2 as described above, and other credit-bearing courses (18 percent), the length of stay at Madison College was more than 10 months, with three-quarters of the students still enrolled at the end of the follow-up period (the middle panel). The time from random assignment to the start of training averaged 1.7 months (not shown), indicating students began their courses relatively quickly after enrollment in the Patient Care Pathway program. This may be one reason for the relatively high participation rate in education and training courses (with 94 percent participating in at least one course; see Exhibit 4-3).

### **4.3 Impact on Receipt of Services**

This section focuses on the degree to which the Patient Care Pathway program increased receipt of education and training, advising, and other support services. An implication of the career pathways framework is that any improvements in the main outcomes of credit and credential attainment (discussed in Chapter 5) will result primarily from impacts on the treatment group's experiences and services tied to education and training.

These analyses expand on the previous analysis in Section 4.2 that described treatment group experiences based on college records. The analyses in this section use data from the follow-up survey to compare the programmatic experiences of treatment and control group members in order to gain insight into how any differences in those experiences might lead to impacts on more distant outcomes. (Exhibit 4-5 below briefly explains how to read impact tables.) Chapter 5 presents the main findings on impacts on amounts of education and training received, focusing particularly on college occupational training.

## Exhibit 4-5. How to Read Impact Tables

Exhibit 4-6 and Exhibit 4-7 in this chapter, as well as exhibits in Chapter 5, list the outcome measure in the analysis in the left-most column (**Outcome**), with the unit of that outcome in parentheses (e.g., "(%)").

The **Treatment Group** column presents the treatment group's regression-adjusted mean outcome, followed in the next column by the control group's actual mean outcome (**Control Group**). The regression adjustments correct for random variation in baseline covariates between the two groups (and thus differ slightly from the raw means). The **Difference** (impact) column lists the difference between the treatment and control group means.

There are several common standards for judging statistical significance—that is, for judging the strength of the evidence that the observed difference between the treatment and control group values is the result of that program element and not the result of chance. The smaller the  $p$ -value, the stronger the evidence. In this report, tests are considered statistically significant and highlighted in tables if the  $p$ -value is less than or equal to .10. Tests with smaller  $p$ -values are separately flagged:

- \* for .10
- \*\* for .05
- \*\*\* for .01

The penultimate column is **Standard Error**, a measure of uncertainty in the estimated impact that reflects both chance variation due to randomization and any measurement error. The final column,  **$p$ -Value**, is the calculated probability that the observed difference between the treatment group and control group values is due to chance.

Outcomes in *italics* apply to a subset of survey respondents (e.g., those who attended education/training). These estimates are not impacts, but unadjusted, non-experimental comparisons.

The following section discusses impacts on education or training receipt after random assignment (Exhibit 4-6) and receipt of advising and employment services (Exhibit 4-7).

- ***The Patient Care Pathway program did not have a statistically significant impact on the proportion of program participants receiving any education or training.***

Exhibit 4-6 shows that the program did not have statistically significant impacts on study participants' receipt of education and training with two exceptions: life skills instruction and English as a Second Language instruction. The high enrollment rates of control group members and lack of program impacts may be partially due to recruitment and study intake activities. The program recruited heavily from within the college, so a large share of treatment and control group members were already enrolled in courses or seeking to enroll. In addition, the unplanned guidance control group participants received prior to random assignment and registration assistance after random assignment may have increased their enrollment levels above what they would have been without this assistance.

**Exhibit 4-6. Receipt of Education or Training after Random Assignment**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value
<b>General Aspects of Education and Training Receipt</b>					
<b>Entire Study Sample</b>					
Received education or training since random assignment (%)					
In any subject/field	81.2	76.9	+4.4	4.0	.276
In a healthcare occupation	66.9	59.5	+7.3	5.0	.141
Since random assignment, ever attended (%)					
Two-year college	73.8	71.7	+2.1	4.5	.643
Four-year college	6.7	2.9	+3.8*	2.0	.064
Proprietary school	1.7	2.3	-0.6	1.4	.681
Adult high school/education	1.0	0.6	+0.4	1.0	.660
Community/non-profit organization	0.0	0.0	0.0	0.0	.660
Other	4.1	3.5	+0.6	2.1	.510
<b>Of Those Who Attended Any Education or Training</b>					
<i>Time spent at school and work at first place attended (%)</i>					
<i>Full-time school and full-time work</i>	5.4	6.8	-1.4	2.9	.615
<i>Full-time school with no or part-time work</i>	24.2	18.9	+5.2	4.9	.288
<i>Part-time school and full-time work</i>	19.5	18.2	+1.3	4.7	.785
<i>Part-time school with no or part-time work</i>	51.0	56.1	-5.1	6.0	.398
<i>Views of classes at first place attended (%)</i>					
<i>Strongly agrees relevant to life/career<sup>a</sup></i>	60.8	55.3	+5.5	5.9	.353
<i>Used active learning methods most/all of the time<sup>b</sup></i>	24.8	18.06	+6.8	4.96	.165
<i>Perceived strong emphasis on community</i>	20.8	18.2	+2.6	4.7	.581
<b>Basic Skills Instruction and Tests</b>					
Received basic skills instruction since random assignment (%)					
Academic skills	31.5	26.6	+5.0	4.6	.284
English as a Second Language	0.0	5.7	-5.7***	1.9	.003
Took college placement exam (%)					
English	30.4	32.0	-1.6	5.1	.761
Math	37.5	33.7	+3.8	5.1	.458
Passed college placement exam (%)					
English	23.6	25.3	-1.7	4.6	.710
Math	21.7	19.3	+2.4	4.4	.590
<b>Life Skills Instruction</b>					
Received life skills instruction since random assignment (%)					
	23.7	15.6	+8.1**	4.1	
Sample size (full survey sample)					
	181	173			
Sample size (those who attended education or training)					
	149	133			

SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.

NOTES: Where not italicized, outcomes apply to the full survey sample, and impact estimates are fully experimental and regression adjusted. Outcomes in italics apply to subset of survey respondents (e.g., those who attended education or training)—for these estimates, between-group differences are unadjusted, non-experimental comparisons. Statistical significance levels, based on two-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.

<sup>a</sup> Percentage who either strongly agreed that classes were relevant to career interests or who strongly disagreed that classes did not relate to anything else in life.

<sup>b</sup> Gives the average percentage who described classes as involving each of a series of active learning approaches at least often, or at least most of the time (items used different scales).

The majority of students in both the treatment (81 percent) and control (77 percent) groups reported enrolling in education and training (in any subject/field) after random assignment. The majority of students in both groups also reported enrolling in education and training in a healthcare occupation specifically (67 percent and 60 percent, respectively).<sup>45</sup> Though a significantly larger number of treatment group members reported they received training from a four-year college than did control group members (seven percent versus three percent), the majority of students in both groups reported they received training from a two-year college after random assignment (about 70 percent).

Of those who reported attending a two-year college after random assignment, the vast majority (99 percent of the treatment group and 97 percent of the control group; not shown) completed at least some of the training at Madison College, implying that both groups had access to many of the same non–Patient Care Pathway services available at the college, such as tutoring, financial aid assistance, and some level of advising.

Exhibit 4-6 also shows that there are few statistically significant differences between the groups in receipt of basic skills instruction, and no statistically significant differences in test taking or pass rates. Access to the Patient Care Pathway program did not produce any statistically significant differences in the receipt of academic basic skills training. Further, a relatively small number of participants in both groups said they received academic basic skills instruction (32 percent of treatment group members and 27 percent of control group members). For both study groups, it is surprising that a small number of participants reported receipt of basic skills instruction. This is particularly true for the treatment group given the high participation rates described in Exhibit 4-4 and that basic skills courses were built into the academies. Further, because basic skills courses would most likely be the next step for control group students who continued at the college and because a high percentage of control group members reported that they had enrolled in education and training, it is surprising that only about one quarter of the control group reported that they received academic basic skills instruction. This may suggest that survey respondents did not think of their courses as “basic skills.”<sup>46</sup>

As noted above there were two areas where service receipt was significantly different for the treatment versus control groups. The program produced an eight percentage point impact on receipt of life skills instruction (24 percent of treatment group members versus 16 percent of

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<sup>45</sup> These proportions represent the percentages of treatment and control group members who reported on the follow-up survey that they participated in an education or training program at Madison College or elsewhere. Though similar, these values differ from the proportions calculated from administrative data. This difference is due to variation in the data source (self-reported measures are subject to recall error).

<sup>46</sup> For reference, the survey question asked participants if they were currently taking or had taken, even for a short time, since their date of random assignment “Other classes to improve your basic reading, writing, or math skills or prepare for a high school equivalency or college placement test? Again, do not count any classes providing regular college credit or occupational training.”

control group members). The life skills instruction reported by the treatment group may reflect the student success component incorporated into the Patient Care Pathway program. The program also had a negative impact on receipt of English as a Second Language (ESL) services. Treatment group members were six percentage points less likely to report receipt of ESL instruction than were control group members (zero percent versus six percent). This is not surprising, as the Patient Care Pathway program did not offer ESL courses.

The italicized rows in Exhibit 4-6 show non-experimental comparisons for the subset of treatment and control group survey respondents who reported attending any training. As shown, there are no statistically significant differences between the groups in time spent at school and work or their view of classes at the first place attended.

- *Patient Care Pathway students who received any education and training were more likely to receive advising.*

Exhibit 4-7 shows impacts on advising and employment services that study participants received from any source and on program supports for the subset of treatment and control group survey respondents who reported attending any education and training (see italicized rows). As shown, there was no statistically significant impact on career counseling or on help arranging supports for school/work/family. There was a negative impact on job search placement assistance (five percent of treatment group members versus 10 percent of control group members). This finding is not surprising given the absence of this component in the Patient Care Pathway program and its focus on preparing students to enter a healthcare diploma or degree program rather than direct employment.

For the subset of survey respondents who reported attending any education or training, significantly more treatment group members ever received academic advising (71 percent versus 55 percent of control group members). Although a large share of the control group also received academic advising, significantly more treatment group members received academic advising three or more times (45 percent versus 35 percent of control group members). However, as discussed above, less than half of treatment group members who attended any education or training reported receipt of academic advising three or more times, which suggests that the majority of the treatment group did not receive the full set of three recommended advising sessions per semester. Reasons students did not receive the full complement of advising, as noted earlier, might include high advisor caseloads, other advisor job responsibilities (e.g., recruitment, program management, and instruction) that limited advisor outreach to students, and the voluntary nature of advising (i.e., there were no penalties for missing sessions).

**Exhibit 4-7. Receipt of Various Supports after Random Assignment**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value
Received assistance from any organization since random assignment (%)					
Career counseling	26.4	22.2	+4.2	4.6	.366
Help arranging supports for school/work/family	13.3	10.5	+2.8	3.4	.410
Job search or placement	6.1	12.1	-6.0*	3.1	.053
Cited financial support as challenge in enrollment or persistence <sup>a</sup>	51.8	49.7	+2.1	5.3	.692
<i>Received supports at first place of instruction attended (%)</i>					
<i>Career counseling</i>					
Ever	20.8	18.3	+2.5	4.8	.602
Three or more times	10.1	5.4	+4.7	3.2	.141
<i>Academic advising</i>					
Ever	70.5	55.0	+15.5***	5.8	.007
Three or more times	45.0	35.1	+9.9*	5.9	.093
<i>Financial advising</i>					
Ever	30.2	36.4	-6.2	5.6	.276
Three or more times	12.1	15.9	-3.8	4.2	.359
<i>Tutoring</i>					
Ever	49.7	46.2	+3.5	6.0	.565
Three or more times	46.3	36.6	+9.7	5.9	.102
<i>Help arranging supports for school or work</i>					
Ever	10.7	7.6	+3.1	3.4	.369
Three or more times	6.8	3.8	+2.9	2.7	.271
<i>Job search/placement assistance</i>					
Ever	4.7	9.9	-5.2*	3.1	.098
Three or more times	2.7	1.5	+1.2	1.7	.499
<i>Received financial assistance at first place of instruction (%)<sup>b</sup></i>					
Grants/scholarship	68.9	65.9	+3.0	5.6	.593
Loan	52.7	48.1	+4.6	6.0	.445
<i>Offered opportunities for related work experience as part of training at first place of instruction (%)</i>					
Clinical internship	32.9	28.8	+4.1	5.5	.459
Visits to local employer	11.4	13.0	-1.6	3.9	.691
Work-study job	12.8	12.2	+0.6	4.0	.876
Apprenticeship	4.1	5.3	-1.2	2.5	.624
Any related work experience (including other)	44.3	42.1	+2.2	5.9	.712
Sample size (full survey sample)	181	173			
Sample size (those who attended education or training)	149	133			

SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.

NOTES: Where not italicized, outcomes apply to the full survey sample, and impact estimates are fully experimental and regression adjusted. Outcomes in italics apply to subset of survey respondents (e.g., those who attended education or training)—for these estimates, between-group differences are unadjusted, non-experimental comparisons. Statistical significance levels, based on two-tailed t-tests tests of differences between research groups, are summarized as follows:

\*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.

<sup>a</sup> Cited financial support challenges as a reason for non-enrollment or leaving school or as a difficulty while attending school.

<sup>b</sup> Reported receiving grant or loan to help cover either tuition/school expenses or living expenses.

Based on the implementation study data, Patient Care Pathway advisors also provided guidance on non-academic topics—such as financial aid advising and non-academic support. If participants did not consider these academic advising topics and so did not report them as such, it is possible that treatment group members worked more intensively with the Patient Care Pathway advisors than their survey responses suggest.

#### 4.4 Summary

Patient Care Pathway program staff implemented the program’s basic components. As noted in Chapter 3, program designers adapted and explicitly linked existing versions of PCA1 and PCA2, adding advising to both. The program implemented the instructional component as designed, and the training did not change significantly over the course of the study period.

Other aspects of the program design deviated or changed over time. First, the program operated on a smaller scale than expected due to recruitment challenges. In response, the program added PCNA as a strategy to bolster study enrollment, but later eliminated it because enrollment was much lower than expected. Because enrollment in PCNA was so low (eight percent of the sample), the availability of the new academy did not affect the Patient Care Pathway program design for the majority of program participants.

Second, the program added instructional supports (i.e., tutoring, a supplemental instructor, the TEAS workshop) to promote student academic success. This change may have strengthened the program design over time by providing additional supports for students. However, departures between program design and changes over time may have weakened the program’s impact. The advising component of the Patient Care Pathway program was less intensive than planned, particularly for the later cohort. Program designers intended for advising to be proactive and delivered over the semester so as to provide “touch points” between staff and students to help address issues as they emerged. In both program design and practice, the program encouraged but did not mandate the minimum three advising sessions. Although most treatment group students who enrolled in training attended at least one academic advising session and were significantly more likely than control group students to report receiving academic advising at least once (71 percent versus 55 percent), less than half of the treatment group reported participating in three or more sessions. Earlier enrolling students were more likely to report receiving three sessions of academic advising than were students in a later cohort. Though the declining receipt of advising suggests that implementation of advising may have weakened over time, it is unclear whether this was a result of advisors being less proactive later in the study period or students opting not to take up the advising services.

One of the primary goals of the Patient Care Pathway program was to facilitate quicker admission to and enrollment in healthcare diploma and degree programs by shortening the time necessary to raise basic skills levels, meet admission requirements, and complete coursework toward a healthcare credential. However, four factors not addressed in the program design created delays

and other barriers for students. First, the adoption of the TEAS assessment as an admission requirement was a barrier because, according to School of Health Education staff, a large share of students failed to achieve the required TEAS scores even after multiple attempts. If students could not achieve the required TEAS scores before the program application window, they would need to retake the exam and wait to apply until the next program application window a year later. Second, many two-year healthcare programs had short, annual application windows, which created delays for program admission (e.g., students who complete an academy in December may need to wait until the following September to apply). Third, the application window for some programs occurred a year in advance of the program start date, so even students with a successful application had to wait additional time until the admission and start date (e.g., students may be accepted to the program in October but unable to start the program until the following September). Finally, long one- to two-year waitlists for those admitted were a barrier to steady program progress and completion because students could not enroll in core program courses and may have had little or no coursework to complete while waiting.

Treatment group members enrolled in the Patient Care Pathway program at a high rate. The vast majority participated in at least one academy (91 percent). More than three-quarters of the treatment group enrolled in other credit-bearing or occupational courses outside the academies, mainly after completion of an academy. Of those who enrolled in other training, 15 percent had obtained a credential and 71 percent were still enrolled in training at the end of the 18-month follow-up period. However, only seven percent of the treatment group gained admission to one of the healthcare programs targeted by PCA1 and PCA2. The low admission rate suggests that there may have been other barriers impeding treatment group students' progression into a healthcare diploma or degree program.

Participation in education and training was also high for the control group. The program did not produce statistically significant impacts in the percentage of treatment group members who enrolled in any education and training (81 percent of treatment group members versus 77 percent of control group members). The majority of students in both groups also reported that they received training from Madison College after random assignment, suggesting that both groups received many of the same non-Patient Care Pathway services available at the college. The comparable participation in education and training by the control and treatment groups, along with advising that was less intensive than planned for treatment group members, suggests that the two groups may have had relatively similar experiences at the college. As noted earlier, the somewhat greater supports provided to control group members (i.e., course planning for some and on-site registration assistance after random assignment) also decreased the service contrast. Chapter 5 analyzes a wider range of impacts on educational attainment and other outcomes.

## 5. Early Impacts of the Patient Care Pathway Program

This chapter reports estimates of the Patient Care Pathway program's early impacts on students' educational attainment, career progress, and non-economic outcomes. For the most part, the estimates cover impacts over an 18-month period after random assignment for the full sample. As part of the exploratory analysis, the research team examined impacts for a longer follow-up period—30 months—for the 68 percent of the students who enrolled early enough to have that length of follow-up. Finally, with respect to an additional outcome—admission to the healthcare programs that were the targets of the Patient Care Pathway program—the chapter presents exploratory 18-, 30-, and 35-month impacts for the full sample.

The chapter begins by describing the hypothesized impacts and outcomes that were included in the analysis. Subsequent sections present findings on educational outcomes, admission to destination healthcare programs, career progress, and non-economic outcomes, respectively. In each case, subsections distinguish among confirmatory, secondary, and exploratory analyses.

### 5.1 Key Hypotheses and Outcomes

The Patient Care Pathway academies aimed to accelerate entry into one- and two-year healthcare programs through a combination of basic skills courses, occupational credit-bearing courses, and advising. Under the program's theory of change, academy participants will quickly improve their basic skills so as to become ready for a healthcare program at the college, as well as improve their college success skills. They will begin to earn college credits and, upon completion of one of the academies, will enter and succeed academically in a healthcare diploma or degree program.<sup>47</sup> Ultimately, Patient Care Pathway program participants will attain credentials, enter career-track employment, and generally improve their well-being and economic status.

The research team classified outcomes as confirmatory, secondary, or exploratory depending on whether they addressed confirmatory, secondary, or exploratory hypotheses, respectively, about the impacts of the Patient Care Pathway program. Exhibit 5-1 (below) lists and describes each outcome.

The *confirmatory* outcome in the Patient Care Pathway program early analyses is the **total number of college credits earned**.<sup>48</sup> Though credential attainment and career-track employment are ultimate goals, it seemed likely that such impacts would not emerge within 18 months. On the other hand, given that the academies included credit-bearing courses and

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<sup>47</sup> Here, as in some other places in the report, the description does not include PCNA, because it served few treatment group members and was not part of the original program design.

<sup>48</sup> The number of college credits does not include developmental education courses, as Madison College did not award credit for such courses.

required just one semester to complete, the accumulation of college credits is an indicator of short-term progress toward credentials that would raise students’ prospects for career-track employment.

**Exhibit 5-1. Outcomes in the Impact Analysis**

Outcome	Description	Data Source	Sample Size	
			Treatment	Control
<b>Confirmatory Hypothesis</b>				
Total number of college credits earned	Credits earned by 18 <sup>th</sup> month after random assignment	Madison College program records	250	249
<b>Secondary Hypotheses</b>				
<b>Education</b>				
Enrolled in college occupational training	Total enrollment in successive months after random assignment (1-6 months, 7-12 months, 13-18 months); any enrollment (Y/N)	Madison College program records	250	249
Number of college credits earned	Total college credits earned in successive months after random assignment (1-6 months, 7-12 months, 13-18 months); any hours (Y/N)	Madison College program records	250	249
Hours of occupational training by place	Total hours of training at a college, another location (e.g., community-based organization); any location <sup>a</sup>	At college: Madison College program records	250	249
		At other location: PACE short-term follow-up survey	181	173
Credential receipt by source	Credential by the type of granting authority	At college: Madison College program records	250	249
		At other location: PACE short-term follow-up survey	181	173
<b>Career Progress</b>				
Perceived career progress	Three-item scale of self-assessed career progress; response categories range from 1=strongly disagree to 4=strongly agree	PACE short-term follow-up survey	181	173
Confidence in career knowledge	Seven-item scale of self-assessed career knowledge; response categories range from 1=strongly disagree to 4=strongly agree	PACE short-term follow-up survey	181	173
Access to career supports	Six-item scale of types of career-supportive relationships in workforce and education settings; response categories are either 1= no or 2=yes	PACE short-term follow-up survey	181	173
<b>Exploratory Hypotheses</b>				
<b>Education</b>				
Admitted to a academy destination program	Admitted to one of the programs that was listed as a destination program for one of the academies	Madison College program records	250	249

**Exhibit 5-1. Outcomes in the Impact Analysis (continued)**

Outcome	Description	Data Source	Sample Size	
			Treatment	Control
<b>Employment</b>				
Working at or above a specified wage	Earning \$12 or more per hour <sup>b</sup>	PACE short-term follow-up survey	181	173
Working in job requiring at least mid-level skills	Whether employed in a job requiring calibrated set of skills based on federal standards <sup>c</sup>	PACE short-term follow-up survey	181	173
Working in a healthcare occupation	Whether employed in one of several healthcare occupational categories	PACE short-term follow-up survey	181	173
<b>Psycho-Social Skills</b>				
Grit	Eight-item scale capturing persistence and determination; response categories range from 1=strongly disagree to 4=strongly agree	PACE short-term follow-up survey	181	173
Academic self-confidence	Twelve-item scale; response categories range from 1=strongly disagree to 6=strongly agree	PACE short-term follow-up survey	181	173
Core self-evaluation	Twelve-item scale; response categories range from 1=strongly disagree to 4=strongly agree	PACE short-term follow-up survey	181	173
Social belonging in school	Five-item scale capturing sense of belonging; response categories range from 1=strongly disagree to 4=strongly agree	PACE short-term follow-up survey	181	173
<b>Life Stressors</b>				
Financial hardship	Two-item scale capturing financial hardship, reported as either an inability to pay rent/mortgage or not enough money to make ends meet; response categories are either 0=no or 1=yes	PACE short-term follow-up survey	181	173
Life challenges	Seven-item scale capturing life challenges that interfere with school, work, or family responsibilities; response categories range from 1=never to 5=very often	PACE short-term follow-up survey	181	173
Perceived stress	Four-item scale capturing perceived stress; response categories range from 1=never to 4=very often	PACE short-term follow-up survey	181	173
<b>Family Structure</b>				
Living with spouse	Two-item scale; response categories are either 0=no or 1=yes <sup>d</sup>	PACE short-term follow-up survey	181	173
Had child since random assignment or currently pregnant	Two-item scale; response categories are either 0=no or 1=yes <sup>e</sup>	PACE short-term follow-up survey	155	142

<sup>a</sup> Credits were converted into occupational training hours, and non-credit “clock hour” courses were converted into in-class hours. See Appendix D.

<sup>b</sup> Threshold selected because it was close to the 60th percentile of hourly wages among employed control group members.

<sup>c</sup> Skill levels based on the federal O\*NET system with thresholds targeted to PACE program target occupations. Occupational categories were coded for PACE by Census Bureau staff from standard open-ended survey items.

<sup>d</sup> Living with an unmarried partner is not counted as living with their spouse.

<sup>e</sup> Reported only for women.

*Secondary* analyses tested hypotheses on additional educational outcomes beyond the confirmatory outcome, as well as on outcomes based on self-assessment of career development. These additional outcomes and associated hypotheses capture short-term effects suggested by the Patient Care Pathway theory of change; as they do for the confirmatory hypothesis, the outcomes have an expected direction (positive).

Finally, *exploratory* outcomes provide additional evidence on program impacts, generally for outcomes of interest with some, though less certain, expectation for effects. The research team expected college experience and advising to have positive effects on assessed career progress, psycho-social skills, and reduced life stressors. In addition, in the course of analysis, the research team added admission to programs the Patient Care Pathway program targeted (destination programs) as an exploratory outcome, when the team became aware of the availability of the data, even though the analysis plan did not include it. Destination program admission is critical to the program model.

## 5.2 Confirmatory and Secondary Impacts on Educational Attainment

This section presents impacts for key measures of educational progress for the full study sample. It assesses findings on the confirmatory and secondary outcomes (Exhibit 5-2). Note that the confirmatory analysis plays a special role as an indicator of whether early impacts are on track.

- ***The Patient Care Pathway program had no impact on average total number of college credits earned (confirmatory hypothesis).***

Treatment group members earned 12 college credits and control group members earned 11—a non-significant difference (see Exhibit 5-2). Control group members thus appear to have been able to enroll in and complete credit-bearing college courses to virtually the same extent as treatment group members, although the control group did not receive Patient Care Pathway program services.

**Exhibit 5-2. Early Impacts (18 Months) on Educational Outcomes (Confirmatory and Secondary Hypotheses)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value
<b>Confirmatory Outcome</b>					
Total number of college credits earned (average)	12.0	11.1	+0.8	0.9	0.176
<b>Secondary Outcomes</b>					
Enrolled in college occupational training in successive months after random assignment (%)					
Months 1-6	84.4	76.7	+7.7 **	3.4	0.013
Months 7-12	70.6	63.5	+7.2 **	4.1	0.042
Months 13-18	65.3	55.8	+9.5 **	4.2	0.013
Any month (during 18-month follow-up period)	88.1	81.5	+6.5 **	3.2	0.020
Total number of college credits earned in successive months after random assignment (average)					
Months 1-6	4.0	3.7	+0.3	0.3	0.166
Months 7-12	4.4	4.1	+0.4	0.4	0.186
Months 13-18	3.5	3.4	+0.1	0.4	0.361
All months (over 18-month follow-up period)	12.0	11.1	+0.8	0.9	0.176
Total hours of occupational training at (average)					
A college	205.0	195.1	+9.8	15.8	0.268
Another place	10.8	3.7	+7.1	8.1	0.191
Any place	230.4	226.7	+3.7	20.8	0.430
Received a credential from (%)					
A college	16.4	15.7	+0.8	3.3	0.410
Another education and training institution	0.7	3.5	-2.8	1.5	0.967
A licensing/certification body	47.8	41.6	+6.2	5.3	0.122
Any source	50.5	48.6	+2.0	5.2	0.354
Sample size <sup>a</sup>	250	249			

SOURCE: Abt Associates calculations based on data from Madison College records and the PACE short-term follow-up survey.  
 NOTES: Statistical significance levels, based on one-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.  
<sup>a</sup> Sample sizes in this row apply to estimates based on college records for the full sample. In the last two panels (total hours of occupational training and credentials by place), estimates for activity at a college are based on college records for the full sample, whereas all other estimates (including those for activity at any source) are based on the subsample who responded to the PACE follow-up survey (181 treatment and 173 control group members).

- ***Treatment group members were more likely to enroll in occupational training over the 18-month follow-up period (secondary hypothesis).***

The Patient Care Pathway program had positive effects on participation in college occupational training: as shown in Exhibit 5-2, some 88 percent of treatment group members enrolled at some point during the follow-up period, compared with 81 percent of the control group, a difference of seven percentage points. This difference was statistically significant at the five-percent level. Furthermore, these statistically significant positive effects were present in each six-month increment of the follow-up period, with effects ranging from seven to 10 percentage points, all also statistically significant at the five-percent level. As of the last six-month follow-up period in the exhibit (months 13 to 18), the majority of students in both the treatment group

(65 percent) and control group (56 percent) were still enrolled, for a positive impact of 10 percentage points.

- *The Patient Care Pathway program had no impacts on other secondary educational outcomes, including college credits earned in successive periods, total hours of occupational training, or credentials received (secondary hypotheses).*

The research team analyzed college credits earned during successive six-month intervals of the 18-month follow-up period. As Exhibit 5-2 shows, there were no statistically significant differences in credits earned by the treatment and control groups in any six-month period. As noted above, it appears that control group members were able to access and succeed in credit-bearing training at a similar rate to treatment group members.

Exhibit 5-2 also shows estimates of effects on total hours of occupational training overall and by place (a college or another place). There were no statistically significant differences between the treatment and control groups in total hours of training, either overall or by place. Finally, there were no statistically significant differences between the two groups in credentials earned. This is true regardless of source (college, other education and training institution, or licensing/certification body). This finding is not necessarily surprising for the short term, given that the Patient Care Pathway program did not provide a credential on its own, except in the case of the small (in enrollment) PCNA academy, which prepared students to take the Certified Nursing Assistant (CNA) exam. Rather, the two primary academies, PCA1 and PCA2, sought to foster entry into longer-term occupational training programs.

To summarize, there was no impact on the confirmatory outcome, total college credits earned. There were few statistically significant differences in secondary educational outcomes between the treatment and control groups. The one exception was enrollment in occupational training, where there was a positive effect.

### **5.3 Exploratory Impacts on Educational Outcomes**

This section first presents impacts on exploratory educational outcomes of enrollment and credential attainment for the subset of study participants for whom 30 months of follow-up data was available (about two-thirds of study participants). It then describes admission to the Patient Care Pathway program's targeted destination programs for the full sample at 18, 30, and 35 months after random assignment.

- *For an early study participant cohort for which additional data was available, impacts on enrollment in occupational training did not persist.*

Exhibit 5-3 shows estimates of effects of the Patient Care Pathway program on longer-term impacts on enrollment and credential attainment for the 68 percent of the study sample randomly assigned by June 2013. This subsample had 30 months of college records available for

analysis. The analysis explored whether the pattern of effects observed over 18 months (Exhibit 5-2) is likely to persist as more follow-up data become available for analysis.

**Exhibit 5-3. Longer-Term Impacts (30 Months) on Selected Educational Outcomes for Earlier Enrollees (Exploratory Hypotheses)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value
<b>Exploratory Outcomes</b>					
Enrolled in college occupational training in successive months after random assignment (%)					
Months 1-6	84.4	73.8	+10.5 **	4.5	.020
Months 7-12	72.9	62.2	+10.7 **	5.0	.033
Months 13-18	70.6	54.7	+15.9 ***	5.1	.002
Months 19-24	52.4	47.1	+5.3	5.4	.326
Months 25-30	44.3	36.6	+7.6	5.2	.147
Any month (during 30-month period)	87.4	83.1	+4.2	3.8	.272
Total number of college credits earned in successive months after random assignment (average)					
Months 1-6	4.1	3.6	+0.6	0.4	.143
Months 7-12	4.8	4.0	+0.8	0.5	.148
Months 13-18	3.4	3.2	+0.2	0.5	.722
Months 19-24	2.7	2.5	+0.2	0.5	.738
Months 25-30	1.7	1.8	-0.1	0.4	.772
All months (over 30-month period)	16.7	15.2	+1.6	1.6	.320
Received college credential by (%)					
Month 18	17.3	18.0	-0.8	4.3	.860
Month 24	20.7	21.5	-0.8	4.6	.869
Month 30	22.3	24.4	-2.1	5.0	.670
Sample size <sup>a</sup>	167	172			

SOURCE: Abt Associates calculations based on data from Madison College records.

NOTES: Statistical significance levels, based on two-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.

<sup>a</sup> Sample sizes in this row apply to estimates based on college records for sample members who underwent random assignment by June 2013.

Exhibit 5-3 shows that the impacts on enrollment seen in the first three 6-month periods did not persist; that is, there were no statistically significant impacts in months 19-24 or in months 25-30, although the point estimates remained positive (but smaller than in the first three periods). The difference over the entire 30-month period also was not statistically significant. In addition, enrollment in occupational courses by the treatment group also declined sharply between months 13-18 and months 25-30, from 71 percent to 44 percent. That credential attainment increased by only five percentage points over the same period implies that a substantial proportion of the treatment group was no longer attending Madison College despite not having earned a credential. There continued to be no statistically significant impacts in any six-month interval either for college credits earned or for receipt of a college credential, and average credits earned in each six-month period declined, reflecting lower enrollment rates.

The 30-month analysis also enables an examination of how effects for the earlier cohort of sample enrollees (those randomly assigned by June 2013) compare with those of the later cohort (assigned after June 2013) over the 18-month period for which data are available for both subgroups. Making this comparison reveals that the point estimates for the earlier cohort (top panel of Exhibit 5-3) were larger than for the full sample (second panel of Exhibit 5-2) in each six-month period. The later-enrolling cohort had no statistically significant positive effects on enrollment for any of the three periods, and two of the three point estimates were negative (not shown). Furthermore, tests for difference in impacts between the early/late cohorts were statistically significant for two of the three periods (again not shown). Implementation findings presented in Chapter 4 suggest two possibilities: a decline in treatment group members receiving three or more sessions of academic advising and imposition of the TEAS requirement for entry into two-year healthcare programs. The higher levels of advising received by earlier treatment group members may have accounted for their higher enrollment rates over the initial 18-month period after random assignment, as advisors may have facilitated their enrollment in some manner. The imposition of the TEAS requirement created a barrier to subsequent enrollment, as students in the later cohorts needed to pass the TEAS in order to be admitted to one of Madison College's two-year healthcare programs and enroll in core program courses.

- *Impacts on destination program admission began to appear by month 30.*

Admission to a subsequent healthcare program targeted by PCA1 or PCA2 is a major milestone along a student's pathway to completion of a credential. The research team assessed impacts of the Patient Care Pathway program on the proportion of students admitted to destination programs, based on Madison College records. (Note that admission to the program does not imply actual enrollment, and as noted in Chapter 4, the data reflect the academic term during which a student was admitted). The analysis treats such hypotheses as exploratory, as the analysis plan did not pre-specify the outcome and the relevant time frame extends considerably beyond the focal 18-month period for this report.

Exhibit 5.4 displays impacts on Patient Care Pathway destination program admission. The top panel shows that at 18 months, there was no statistically significant effect. However, by 30 months, there is an impact that is statistically significant at the 10-percent level (20 percent of treatment group members versus 14 percent of control group members). By 35 months, more treatment group members gained admission to destination programs relative to the control group (27 percent versus 17 percent). This difference is statistically significant at the one-percent level. The lower two panels of Exhibit 5.4 show effects on admission to the destination programs of PCA1 and PCA2 separately. At no point are there effects on admission to PCA1 destination programs. Thus, the effect on admission to any academy destination program that are shown in the top panel is due entirely to positive effects on admission to a PCA2 destination program. By month 35, the admission rate to a PCA2 destination program is 20 percent for

treatment group members compared with only 10 percent for the control group, a 10 percentage point increase statistically significant at the one-percent level. However, even with this positive effect, it is notable that only about a third of the 59 percent of treatment group members who successfully completed PCA2 were admitted to a PCA2 destination program by 35 months (20 percent of the treatment group).

This analysis indicates that effects on program admission occurred, but substantially later than envisioned in the analysis plan based on the program’s theory of change. Few admissions occur soon after completion of PCA1 or PCA2 (as was the intent of the program by design), and only about one in 14 sample members, treatment or control group, gained admission even by month 18. Chapter 4 suggests three possible explanations for lags in admissions (see hypothetical timeline in Exhibit 4-2). First, some healthcare programs had short, once-yearly application windows and students may have had to wait up to an academic year to apply. Second, some programs had application windows up to a year in advance of when a student could actually gain admission to a program. Finally, the college adopted the requirement of passing the TEAS to gain admission to a PCA2 destination program. A fourth barrier described in Chapter 4 – long program waitlists – also created delays between program admission and enrollment in program courses. However, students on program waitlists are recorded as admitted to the program in Madison College’s admissions data and thus program waitlists would not contribute to the low rate of program admissions, but would affect timelines for completing degrees. Note that the admission data capture only Patient Care Pathway destination programs and do not count admissions to other programs at Madison College.

**Exhibit 5-4. Impacts on Admission to Academy Destination Programs (Exploratory Hypotheses)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	p-Value (two-sided)
Any admission to a PCA destination program in successive months after random assignment (%)					
By month 18	6.8	7.2	-0.5	2.3	.842
By month 30	20.4	14.1	+6.3*	3.3	.058
By month 35	27.0	17.3	+9.7***	3.5	.006
Any admission to a PCA1 destination program in successive months after random assignment (%)					
By month 18	4.4	5.2	-0.8	1.9	.671
By month 30	8.0	8.0	0.0	2.4	.997
By month 35	9.2	8.0	+1.2	2.5	.632
Any admission to a PCA2 destination program in successive months after random assignment (%)					
By month 18	2.4	2.4	0.0	1.5	.995
By month 30	13.0	6.8	+6.2**	2.7	.023
By month 35	19.6	10.0	+9.6***	3.1	.002
Sample size <sup>a</sup>	250	249			

SOURCE: Abt Associates calculations based on data from Madison College records. The research team did not impute program admissions for study participants who attended institutions other than Madison College.

NOTES: Statistical significance levels, based on two-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.

<sup>a</sup> Sample sizes in this row apply to estimates based on college records for the full sample.

## 5.4 Impacts on Early Career Progress (Secondary Hypotheses)

This section presents impacts of the Patient Care Pathway program on three measures of students' self-assessed progress toward career goals: perceived career progress, confidence in career knowledge, and access to career supports.

- *The Patient Care Pathway program had an impact on perceived career progress.*

As Exhibit 5-5 shows, there was a statistically significant impact on perceived career progress. The treatment group had an average score of 3.57 compared with 3.43 for the control group. The difference of 0.14 was statistically significant at the five-percent level, and indicates that treatment group members had significantly higher levels of perceived career progress. Per the Patient Care Pathway theory of change (see Chapter 2), perceived career progress may be an early measure of successful career-track employment. Longer-term analyses will explore whether this translates into actual career progress.

**Exhibit 5-5. Early Impacts (18 Months) on Selected Career Outcomes (Secondary Hypotheses)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	Effect Size	p-Value
<b>Secondary Outcomes</b>						
Perceived career progress <sup>a</sup>	3.57	3.43	+0.14	0.07	+0.20**	.030
Confidence in career knowledge <sup>b</sup>	3.31	3.27	+0.05	0.06	+0.08	.225
Access to career supports <sup>c</sup>	1.69	1.69	+0.00	0.03	+0.01	.452
Sample size <sup>d</sup>	181	173				

SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.

NOTES: Statistical significance levels, based on one-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one percent level; \*\* at the five percent level; \* at the 10 percent level.

<sup>a</sup> Three-item scale tapping self-assessed career progress; response categories range from 1=strongly disagree to 4=strongly agree.

<sup>b</sup> Seven-item scale tapping self-assessed career knowledge; response categories range from 1=strongly disagree to 4=strongly agree.

<sup>c</sup> Six-item scale tapping self-assessed access to career supports; response categories are either 1=no or 2=yes.

<sup>d</sup> Sample sizes in this row apply to sample members responding to the PACE follow-up survey.

## 5.5 Impacts on Other Exploratory Outcomes

This section reports impacts on outcomes in four additional domains: employment, psycho-social skills, life stressors, and family structure. Exhibit 5-6 summarizes the findings.

- *There was a statistically significant, but negative, impact on working at a job with at least mid-level skills.*

The research team assessed several indicators of career pathways employment: whether study participants were working in a job paying at least \$12 per hour, whether they were working in a job requiring at least mid-level skills, and whether they were working in a healthcare occupation. Because the Patient Care Pathway program aimed to prepare students for further education and

not direct employment (with the exception of PCNA), the team did not expect to see many impacts on employment in the 18 months after random assignment. The one statistically significant difference (at the five-percent level)—for working in a job requiring at least mid-level skills—was negative. More control group members were working in these jobs 18 months after randomization than were treatment group members (21 percent versus 13 percent). Given that enrollment by treatment group members in college was about 10 percentage points higher in months 13-18 than for control group members, this negative employment impact may have been due to treatment group members reducing their employment efforts in order to devote more time to school.

- *The Patient Care Pathways program had a statistically significant impact on academic self-confidence.*

The second group of exploratory outcomes consisted of four indices of self-assessed psycho-social skills. These were grit (i.e., persistence and determination), academic self-confidence, core self-evaluation, and sense of social belonging in school.

There was a statistically significant impact for just one of these outcomes—academic self-confidence. Treatment group members had a higher average score than did control group members. The difference was statistically significant at the 10-percent level. As noted in the program theory of change, improved psycho-social skills, including academic self-confidence, are intermediate outcomes that may positively affect main outcomes such as postsecondary educational attainment in the longer term.

**Exhibit 5-6. Early Impacts (18 Months) on Other Outcomes (Exploratory Hypotheses)**

Outcome	Treatment Group	Control Group	Difference	Standard Error	Effect Size	p-Value
<b>Exploratory Outcomes</b>						
Indicators of Career Pathways Employment (%)						
Working in a job paying \$12/hour or more <sup>a</sup>	30.3	37.9	-7.6	4.9	-0.16	.125
Working in a job requiring at least mid-level skills	12.6	20.9	-8.4**	4.0	-0.22**	.039
Working in a healthcare occupation	31.2	29.1	+2.2	4.7	+0.05	.645
Indices of Psycho-Social Skills (average)						
Grit <sup>b</sup>	2.91	2.91	+0.00	0.05	+0.01	.927
Academic self-confidence <sup>c</sup>	4.53	4.39	+0.14*	0.08	+0.19*	.081
Core self-evaluation <sup>d</sup>	3.24	3.20	+0.04	0.05	+0.09	.412
Social belonging in school <sup>e</sup>	3.28	3.21	+0.08	0.06	+0.14	.179
Indices of Life Stressors (average)						
Financial hardship <sup>f</sup>	0.40	0.44	-0.05	0.05	-0.10	.332
Life challenges <sup>g</sup>	1.48	1.59	-0.10**	0.05	-0.23**	.031
Perceived stress <sup>h</sup>	2.06	2.02	+0.04	0.08	+0.05	.612
Family Structure (%)						
Living with spouse	23.1	31.0	-7.9**	4.0	-0.21**	.046
Had child since random assignment/currently pregnant <sup>i</sup>	11.5	14.2	-2.7	3.9	-0.08	.486
Sample size <sup>j</sup>	181	173				

SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.

NOTES: Statistical significance levels, based on two-tailed t-tests tests of differences between research groups, are summarized as follows: \*\*\* statistically significant at the one-percent level; \*\* at the five-percent level; \* at the 10-percent level.

<sup>a</sup> After assessing wage distributions for employed control members, the research team established this cut-point at approximately the 60th percentile of wages.

<sup>b</sup> Eight-item scale capturing persistence and determination; response categories range from 1=strongly disagree to 4=strongly agree.

<sup>c</sup> Twelve-item scale capturing academic self-confidence; response categories range from 1=strongly disagree to 6=strongly agree.

<sup>d</sup> Twelve-item scale capturing core self-evaluation; response categories range from 1=strongly disagree to 4=strongly agree.

<sup>e</sup> Five-item scale capturing sense of belonging; response categories range from 1=strongly disagree to 4=strongly agree.

<sup>f</sup> Two-item scale capturing financial hardship, reported as inability to pay rent/mortgage or not enough money to make ends meet; response categories are 0=no to 1=yes.

<sup>g</sup> Seven-item scale capturing life challenges that interfere with school, work, or family responsibilities; response categories range from 1=never to 5=very often.

<sup>h</sup> Four-item scale capturing perceived stress; response categories range from 1=never to 4=very often.

<sup>i</sup> Applies only to female respondents; sample size for this outcome is 155 treatment; 142 control.

<sup>j</sup> Sample sizes in this row apply to sample members responding to the PACE follow-up survey.

- **The program had a statistically significant and negative impact on reported life challenges.**

The third group of exploratory outcomes included self-reported indices of life stressors, defined as reports of financial hardship, life challenges, and perceived stress.

There was evidence of a positive impact for only one—whether life challenges affected school, work, or other responsibilities. The treatment group had a lower average score (i.e., fewer life challenges) than did the control group. The difference was statistically significant at the five-percent level. A positive impact on this intermediate outcome may lead to better longer-term main

outcomes related to postsecondary attainment, employment, and well-being, since life challenges can interfere with the attainment of these outcomes. The program appears to have succeeded in reducing these challenges, possibly through services provided, such as advising.

- *Treatment group members were significantly less likely to be living with a spouse.*

The final group of exploratory outcomes concerned family structure: whether the study participant was living with a spouse and whether the participant had had a child since random assignment or was pregnant at the time of the follow-up survey). (As noted in Exhibit 5.1, these questions were only reported for female respondents.) These outcomes were included in the analyses because previous research suggests that education and career progress can in the short run raise the opportunity costs of marriage and childbearing (Buckles 2008). Of these two outcomes, only one—living with a spouse—was statistically significant (and negative), at the five-percent level.

Though the Patient Care Pathway program did not produce substantial impacts on educational outcomes, some impacts on the exploratory outcomes described above were statistically significant. Two of these—increase in academic self-confidence and reduction in perceived life challenges—are intermediate outcomes that the program theory of change suggests may be precursors to main outcomes such as postsecondary attainment and career-track employment. However, given that the study examined a substantial number of exploratory outcomes and that there was no clear overall pattern of positive impacts, it is possible that some of these statistically significant effects are due to chance.

## 5.6 Summary

Impact analyses for an initial 18-month follow-up found little evidence of positive effects from the Patient Care Pathway program. The research team found no statistically significant impact on the study's confirmatory outcome—college credits earned. Occupational training enrollment rates were modestly higher for treatment than for control group members, but other educational outcomes showed little evidence of impact.

Exploratory analyses of admission to PCA1 and PCA2 destination healthcare programs over a longer follow-up period suggest that longer-term positive impacts on credits and credentials may emerge. After 35 months, treatment group members were 10 percentage points more likely than their control group counterparts to be admitted to a Patient Care Pathway–targeted destination program. This effect is entirely due to admissions into PCA2 destination programs, which are the two-year degree programs. Importantly, admission to a two-year healthcare program is still an early career step. For the Patient Care Pathway program to be successful requires positive effects on earning credits and credentials and, eventually, higher rates of employment and higher earnings. Although early findings on these key outcomes were disappointing, the evidence on longer-term enrollments into destination programs suggests that positive longer-term impacts cannot be ruled out.

## 6. Conclusions

This chapter provides additional discussion of the Patient Care Pathway program findings to date. The first section briefly summarizes the key findings. The second section explores how findings relate to other research on programs similar to Patient Care Pathway and how they reflect on program implementation and design. The final section gives a brief preview of the key questions that longer-term follow-up analyses will address.

### 6.1 Summary of the Patient Care Pathway Program Findings

The Patient Care Pathway program at Madison College included three academies, two of which operated through the entire study period (PCA1 and PCA2). The one-semester academies targeted students whose basic skills were too low to enter their healthcare diploma or degree program of choice. Through a combination of basic skills training, occupational skills training, and advising, as well as direct entry into a healthcare degree program for PCA2 completers, the program aimed to remediate students' skills quickly and facilitate more rapid entry into a healthcare program than they could achieve through the college's standard series of developmental education courses.

The following points summarize the evaluation's key findings:

- Recruitment proved challenging. Program staff recruited just half the target sample (500 of 1,000). Recruitment was especially difficult for PCA1.
- The program implemented a key component—instruction—largely as planned, with basic skills instruction in specific courses contextualized for healthcare.
- Program staff modified the program in response to perceived student needs, including adding a supplemental instructor for the PCA2 Chemistry class and organized group tutoring sessions for PCA1.
- Control group members received more guidance on course selection and registration than planned—a deviation from the study protocol.
- College policies affected academy completers' timely transition to healthcare programs. There were four key barriers to program admission and completion: implementation of the TEAS assessment as an admission requirement for healthcare degree programs, short and infrequent application windows, lengthy lags between application windows and program admission and start dates, and – once admitted – long waitlists that delayed students' enrollment in and completion of core program courses.
- More than 90 percent of treatment group members participated in an academy. Most (75 percent) participated in PCA2. Almost 80 percent of treatment group members enrolled in credit-bearing courses after completing one or more academies.

- The program increased enrollment in credit-bearing courses overall and for each of three six-month intervals in the 18-month follow-up period. However, the percentage of treatment group members enrolled in each successive six-month period declined.
- The Patient Care Pathway program did not increase the **total number of college credits earned** by 18 months after random assignment—the confirmatory outcome at this stage of the evaluation. Similarly, the program did not increase credits or credential receipt in any of the three six-month intervals within the 18-month follow-up period.
- Follow-up data at 30 months after random assignment, available for two-thirds of the sample, show that statistically significant enrollment impacts disappear after 18 months.

Taken by themselves, these findings would suggest that it is unlikely that the Patient Care Pathway program will increase treatment group members' receipt of healthcare credentials. However, it would be premature to declare that the program will not meet this key goal. Despite the limited positive findings on enrollment, and no impacts on credits and credentials, the program did significantly increase admission to a destination healthcare program by 35 months after random assignment. This increase was the result of a 10 percentage point increase in admissions to the two-year healthcare degree programs by PCA2 completers that emerged only after the 18-month follow-up period.

## 6.2 Understanding the Findings

As a bridge program, the goal of the Patient Care Pathway program was to enable participants to remediate basic skills deficits more quickly than was possible through the college's standard sequence of developmental education courses. Thus, under the theory of change, treatment group members would enroll in and complete PCA1 or PCA2 in one semester (some would complete both, taking longer) then gain admission and transition quickly into one of the one-year diploma or two-year degree programs that the academies targeted. By contrast, control group members would go through as many as several semesters of developmental education before potentially gaining admission to destination programs, but later and at a lower rate. Admission to a healthcare program, along with the fact that some of the academy courses were credit bearing, would enable treatment group members to earn more credits than control group members within the 18-month follow-up period.

However, in practice, only about seven percent of treatment group members gained admission to a destination program by 18 months after random assignment despite high rates of academy completion (81 percent in PCA1 and 78 percent in PCA2). As described just above, and in more detail in Chapter 4, college policies for application to healthcare programs sometimes created long lags between when a student could complete an academy versus actually gain admission and enroll in core healthcare courses. Such barriers to quick entry into healthcare destination programs appear not to have limited students' enrollment in other college courses. For example, in months 13-18 after random assignment, almost two-thirds (65 percent; Exhibit 5-2)

of treatment group members enrolled in college occupational courses, but nearly 90 percent of them had not enrolled in a Patient Care Pathway destination program (58 percent).<sup>49</sup> Although some courses were for credit, credit accumulation was low, with only about four credits earned in the same six-month period.

Although control group members' enrollment in college courses was somewhat lower than for their treatment group counterparts (56 percent compared with 65 percent over months 13-18), the control group's enrollment was higher than expected. This level of enrollment implies that many college courses other than developmental education (which are not included in these enrollment numbers) were available to the control group.<sup>50</sup> As a result, the control group accumulated credits at a similar rate as the treatment group. Thus, over 18 months, fewer treatment group members successfully applied to destination programs and more control group members took college courses than anticipated.

In the longer term, findings show increasing impacts on destination program enrollment. By 35 months after random assignment, control group admissions increased to 17 percent (from seven percent; Exhibit 5-4), whereas treatment group admissions increased more sharply to 27 percent (also from seven percent). These findings suggest that some effect on program admissions occurred, but substantially later than the theory of change implied and the research team expected.

These findings raise three questions: Are the findings in line with other research on bridge programs? Do they reflect problems with program implementation? Do they reflect a weakness in the program design?

To the first question, although bridge programs are a promising approach, there is currently very limited evidence from rigorous evaluations regarding their effects.<sup>51</sup> Existing evaluations do not show a consistent pattern of positive effects on credits earned, the confirmatory outcome at 18 months for the Patient Care Pathway program. For example, a 24-week bridge program called New Visions, at Riverside Community College (RCC) in California, that targeted TANF recipients had similar elements to the Patient Care Pathway program. The RCC bridge program had basic skills courses in math, English, and reading, as well as occupational skills courses in office-related computer software. The program included a guidance course focused

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<sup>49</sup> That is, 65 percent minus seven percent who gained admission to a destination program equals 58 percent.

<sup>50</sup> A review of administrative data on the courses that treatment and control group members enrolled in showed that control group members were slightly more likely to enroll in non-healthcare courses or their prerequisites, but the vast majority of the courses in which both groups enrolled were in the healthcare area. In addition, commonly attended courses were some that were part of a healthcare program, but could also be taken outside of such a program, for example, introductory courses in psychology and sociology.

<sup>51</sup> A majority of PACE programs have a bridge program as a component, so knowledge of these programs will be improving.

on critical thinking, problem solving, communication, and study skills. Like the Patient Care Pathway program, academic instruction was contextualized (e.g., math problems arising in varying occupations). After the 24-week core program, participants could move into “occupational mini-programs” at RCC. Compared with a randomly assigned control group, the treatment group members were slightly more likely to enroll in courses at RCC but outside the New Visions program, but no more likely to accumulate regular college credits (Fein and Beecroft 2006). A random assignment evaluation of a summer bridge program in Texas showed no effects on subsequent earning of credits (Barnett et al. 2012). However, unlike the Patient Care Pathway program, this program had no credit-bearing courses and was not contextualized to a particular occupational area.

On the other hand, a non-experimental study of the Integrated Basic Education and Skills Training Program (I-BEST) in Washington State that, like the Patient Care Pathway program, is a bridge program incorporating occupational training and contextualized basic skills, found a positive effect on credits, although the strongest study component does not estimate effects on the number of credits earned (Zeidenberg, Cho, and Jenkins 2010).<sup>52</sup> However, I-BEST includes elements that are not part of the Patient Care Pathway program, notably team-teaching by basic skills and occupational training instructors and the ability of students to earn short-term occupational certificates.

No study other than this one (that the research team is aware of) has estimated the effect of a bridge program on admission to a destination program. Thus, there is no research context to assess whether the effects on admission observed to date are large or small, or are likely to lead to subsequent positive effects on the main educational outcome, attainment of a healthcare credential. Positive effects on admission to a destination program are a significant indicator given that such admission was a central intermediate goal of the Patient Care Pathway program. However, even with the impact on admission to a PCA2 destination program, that this occurred for only one in five treatment group members even by 35 months will limit the size of any subsequent impacts on college credits and degrees. Whether the effects are more significant for policy more generally will become clear with longer follow-up and analysis of credit and credential impacts. As noted below, a future report will track these outcomes over a longer time frame.

The second question relates to implementation. The Patient Care Pathway program appeared to be implemented as planned in many respects. The training was delivered as expected, including contextualizing basic skills courses for healthcare. A few adaptations enhanced the program by incorporating instructional supports and instructor advising. One key component, though—advising—was not as intensive as expected. Whether this is an implementation failure

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<sup>52</sup> A random assignment evaluation of I-BEST at three colleges in Washington is part of PACE.

is less clear. Program staff designed the advising component to include three sessions each semester, but did not mandate attendance.

Advisors reported that they proactively contacted those students deemed most at risk of failing a course or dropping out of an academy. It is not clear if the more limited outreach was due to high caseloads, some staff turnover in this role, or a general philosophy that students who are performing well should be allowed to seek assistance as needed. Regardless of the cause, less than half of students reported receiving three academic advising sessions. For students who did not receive the full set of advising sessions, it is not clear what topics were covered. For example, did the student and advisor put in place an academic plan that, among other activities, indicated what the student would do while on a waitlist?

The third question focuses on design. This section started with a review of the assumptions underlying the theory of change: essentially, students would need as many as several semesters to remediate, that the alternative to the Patient Care Pathway program was a standard developmental education sequence, and that program participants would, in a one-semester academy that combined basic skills with occupational courses and advising, move along quickly into further healthcare training at the college. This central design element of acceleration addressed an important barrier to entry into occupational training that research has strongly established.

However, in the context of Madison College, the program design did not address other major sources of delay to entry into healthcare training, namely policies that created lengthy periods of time between students' completion of an academy and when they could actually gain admission to a destination healthcare program and enroll in program courses. Thus, despite the high completion rates of PCA1 and PCA2 students, only about one in 14 academy completers had gained admission to such a healthcare program by month 18 after random assignment. Further, even among those admitted, program waitlists likely caused a delay in enrollment in program courses and progression towards degree completion. This rate of entry improved by month 35, producing a 10 percentage point impact on admission, but still only slightly more than a quarter of treatment group members (about 40 percent of all academy completers) gained admission to a destination healthcare program. As shown in Exhibit 5-3, however, for the two-thirds of the sample with 30 months of follow-up, over the 12-month period following month 18, college enrollment declined by 27 percentage points, whereas credential attainment increased by only five percentage points. These numbers imply that many academy participants dropped out of the college in the face of the long delays that policies created for entry into healthcare programs. Taking all these together, it appears that the Patient Care Pathway design inadequately addressed the full range of barriers that its participants faced to gain admission to a destination healthcare program at Madison College.

### 6.3 Future Research

The next PACE report for the Patient Care Pathway program will analyze longer-term educational outcomes more systematically at 36 months, and longer for some outcomes. In addition, it will include a more systematic look at impacts on employment and earnings—although given findings to date, it seems unlikely that positive effects in this time frame will occur in those domains.

The most critical question that the next, and possibly subsequent, analyses will address is whether the Patient Care Pathway program’s positive effects on admission to two-year degree programs translate into effects on treatment group members’ earning credits and credentials. Because the largest effects on admission did not occur until 35 months after random assignment and were on admission to two-year degree programs, it is clear that a complete answer to this question will require more than 36 months of follow-up. At the time of the next report, college records will be available for a longer period than 36 months, so some evidence on whether admission effects translate into credit effects will be available. However, a more complete answer to whether the Patient Care Pathway program will have a positive effect on credit accumulation, as well as an answer to whether admission effects will translate into credential effects, will require even longer follow-up in a third round of analysis.

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