The Impact of a Randomly-Assigned Time & Place Management Initiative on Work and Retirement Expectations

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December 8, 2014

Funding: This work was supported by the Alfred P. Sloan Foundation through a grant to the Sloan Center on Aging & Work at Boston College: Assessing the Business Impact of Time & Place Management Policies—What's Age Got to Do with It? [Grant #2011-6-23].

Acknowledgements: We are grateful to the leaders of ModernMedical who have partnered with us on the Time and Place Management Study.

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Abstract

This paper examines the causal relationship between a workplace flexibility arrangement and retirement expectations. The data come from a unique large-scale randomly-assigned Time and Place Management (TPM) initiative that recently took place at a regional healthcare system in the United States with more than 9,000 employees. A difference-in-differences approach was used to assess treatment impacts among older full-time career employees and comparisons were made with a nationally-representative group of older Americans from the Health and Retirement Study (HRS). We found that the TPM initiative had a statistically-significant impact on employees' retirement expectations, as employees in the treatment group were more likely than those in the control group to expect to remain with the organization until retirement. The results indicate that workplace flexibility could be one solution to promote continued work later in life, as flexible work arrangements have the potential to impact retirement expectations and patterns of labor force withdrawal.

Keywords: Economics of aging, partial retirement, gradual retirement; flexible work options, time and place management, experimental design, random assignment

I. Introduction

Continued work later in life has been a key focus of policymakers looking to alleviate the financial strains of an aging society (Board of Trustees of OASDI, 2013). Social Security, private pensions, and savings–the traditional three pillars of retirement income–have all experienced dramatic changes since the mid-1980s that have altered the relative attractiveness of work and leisure later in life, nearly uniformly in favor of work (Quinn, Cahill, & Giandrea, 2011). Older Americans have responded to these changes and are now working later in life at rates not seen since the mid-1970s (Cahill, Giandrea & Quinn, *forthcoming*). Still, labor force participation rates will need to continue rising if reductions in standards of living are to be staved off as our society ages. Indeed, after the demographic holiday of the past decade, we are only on the cusp of a rapidly aging society (Arias, 2012, U.S. Census, 2012).

The provision of workplace flexibility, or effective management of time and place options, could be one strategy for promoting continued work later in life. These options, better known as flexible work arrangements (those policies or programs that give employees more control over where, when and how much to work) have the potential to affect both the timing of retirement as well as patterns of labor force withdrawal. Indeed, for most older Americans retirement is not a one-time permanent event, but rather a process that involves some form of job transition prior to complete labor force withdrawal. Studies based on the Health and Retirement Study (HRS), a large ongoing nationally-representative data of older Americans that began in 1992, have shown that the majority of older career workers change employers, moving to bridge jobs – those that follow career employment and precede retirement – prior to exiting the labor force completely (Cahill, Giandrea, & Quinn, 2006, 2012, 2013; Quinn, 1999, 2010; Ruhm,

1990, 1991; Shultz & Wang, 2011). Further, a sizable minority, some 15 percent, re-enter the labor force after an initial exit (Cahill, Giandrea, & Quinn, 2011; Maestas, 2010).

The work arrangement in which individuals stay with their current employer later in life but reduce the number of hours worked, sometimes referred to as phased retirement, is the least common of the three types of gradual retirement (Cahill, Giandrea, & Quinn, 2013; Johnson, 2011; Kantarci & van Soest, 2008). The reason for the low prevalence of phased retirement is largely a labor demand story. Survey data point solidly to older Americans having a preference for reducing hours in career employment (AARP, 2014; Hoffman & Andrew, 2010; James, Swanberg & McKechnie, 2007; Sloan Center on Aging & Work at Boston College, 2013), but such options are rarely available to them. The reasons employers resist such arrangements are justifiable. Regulations regarding the receipt of pension benefits, and anti-discrimination laws, both with respect to age and income, prevent employers from offering flexible work hours to some employees (e.g., older; higher income) and not to others (Hoffman & Andrew, 2010; Johnson, 2011; Sheaks, Pitts-Catsouphes, Smyer, 2010).

If flexible work arrangements are available, a key question is the extent to which such options have an impact on the work and retirement decisions of employees. The evidence regarding such effects is limited, however, as the vast majority of studies that have attempted to examine these relationships have fallen short of addressing the role of self-selection within the process. Instead, studies have identified associations between the availability of workplace flexibility policies in career employment later in life and the extent to which individuals remain both with their employers and in the labor force. These studies support the potential for workplace flexibility arrangements to play a larger role in extending working lives. The critical

element needed to ascertain causality – random assignment – is, however, largely lacking in this literature.

This paper presents findings from a study designed to address the causal relationship between the provision of options for making changes to the amount and place of work on, among other outcomes, the work and retirement expectations of an organization's employees. The data for this study come from a unique large-scale randomly-assigned Time & Place Management (TPM) initiative that took place at a regional healthcare provider in the United States ("ModernMedical" or "ModMed") with more than 9,000 employees and 600 work units.[i] Random assignment took place at the work unit level. Employees in work units assigned to the treatment group were invited to participate in a training effort designed to explore and facilitate Pareto-optimal changes for employees, managers, and the organization. If such an arrangement could be determined, the organization encouraged employees and managers to pursue the change. Changes could include reductions in hours, schedule changes, and a host of other mutually-agreeable options conceived by either the employee or manager.

Nearly all employees and managers at the organization were invited to participate in a series of four detailed longitudinal surveys between September 2012 and January 2014 that covered demographic, economic, and job characteristics, and expectations about work and retirement.[ii] Managers were asked additional questions about the productivity and attitudes of the employees in their work units, and were also invited to participate in three additional "check-in" surveys that took place between the employee and manager surveys. In addition to these survey data, the organization provided detailed monthly data on turnover and churn within work units, financial performance of work units, patient satisfaction, and overtime hours at the work unit level.[iii] This incredibly rich longitudinal dataset with individuals from randomly-assigned work

units and subjective and objective data allows for a detailed analysis of the causal impact of flexible work arrangements on work and retirement decisions.

This paper is structured as follows. The next section provides background on the potential impact of workplace flexibility on employer and organizational outcomes. Section III describes the unique dataset and methodology used to conduct our analysis, as well as the Health and Retirement Study, which is used to benchmark the findings from the ModMed dataset. Section IV describes the process by which work units were randomized. Section V describes how retirement transitions are defined and measured. Section VI presents the main findings. The final sections put our findings into context and provide some key discussion points about the likely importance of options for flexible work options on the work decisions of older Americans.

II. The potential impact of workplace flexibility

The vast majority of studies that have examined the relationship between flexible work arrangements (or TPM options) and employee and business outcomes generally, including work and retirement decisions, have primarily identified associations as opposed to causal links. For example, a meta-analysis of 92 studies conducted by Combs, Liu, Hall, and Ketchen (2006) found that high performance TPM practices such as flexible work options and training are associated with enhanced organizational performance. Bond, Thompson, Galinsky, and Prottas (2002) found that flexible work options are associated with fewer mental health problems, greater work-family balance, and higher levels of life satisfaction. On the basis of Sloan Center research, TPM has been related to the extent to which employees can engage and creatively address business challenges and opportunities (James, McKechnie and Swanberg, 2011; Matz-Costa, Pitt-Catsouphes, Besen, and Lynch, 2009; Matz-Costa and Pitt-Catsouphes, 2010; Pitt-Catsouphes, Matz-Costa, and Besen, 2009a). Some studies even reveal positive relationships

between access to TPM options and outcomes for employees whether they use them or not (Pitt-Catsouphes, Matz-Costa, and Besen, 2009b).

Studies have shown that flexible work arrangements are associated with other positive outcomes as well, such as the ability to attract employees (Hudson Highland Group, 2008), achieve higher retention rates (Pavalko and Henderson, 2006; Baughman, DiNardi, and Holtz-Eakin, 2003), and promote more willingness to help out at work (Eaton, 2003). Flexible work arrangements have also been associated with lower levels of absenteeism. A Council of Economic Advisors (CEA) report highlights what the CEA describes as "perhaps the most compelling evidence of the impact of workplace flexibility on absenteeism" (Council of Economic Advisors, 2011). The evidence comes from a study that examined absenteeism prior to, during, and following a public utility's one-year workplace flexibility trial in which one subunit of the public utility was offered the program and another unit was not. Before the program the two units had similar rates of absenteeism. During the trial, absenteeism declined by more than 20 percent among employees in the subunit that was offered the program while absenteeism remained relatively unchanged for the other employees. Once the trial ended, absenteeism for the subunit offered the program reverted to the pre-trial level (CEA, 2010; Dalton and Mesch, 1990). Beyond the Dalton and Mesch (1990) study, however, evidence is limited regarding the causal impact of workplace flexibility initiatives.

Further, the research on the impact of flexible work schedules is not uniformly positive. Christensen and Staines (1990) examined the advantages and disadvantages of flextime to both employers and employees and concluded that "no compelling case can be made for flextime solely on the grounds of employers' conventional concerns with organizational effectiveness, organizational membership or job attitudes" (Christensen and Staines, 1990, p. 475). Moreover,

Baltes et al. (1999) found that, for professionals, flexible work arrangements did not necessarily reduce family conflict. Clark (2000) even took these findings one step further arguing that flexible work arrangements could have a negative impact on work-family balance by leading to home lives that are interrupted by work and work lives that are interrupted by family issues. Still, while these studies have shown the potential for negative or no effects, the majority of published studies find a positive association between workplace flexibility and organizational and individual outcomes (see, for example, Bond, et al., 2002; Cascio & Boudreau, 2011; Combs, et al., 2006).

A broader challenge with the existing literature is the extent to which the findings – either positive or negative – are indicative of causal relationships. The dominant empirical difficulty pertains to selection regarding the type of employer that chooses to implement a workplace intervention and the type of employee who chooses to partake in it. Employers who have already offered a particular workplace intervention almost certainly did so because they felt that, in their particular circumstance, there was a net benefit to doing so. It is also safe to assume that employees who have already taken advantage of a one of these TPM options did so because they themselves had something to gain. Therefore, when researchers examine the association between workplace interventions and outcomes, they are likely to see a positive relationship – those who were most likely to benefit from the arrangement participated and those who were least likely to benefit did not.

The relationship between flexible work arrangements and performance is a concern as well. It may be the case that some employers offer flexible work arrangements to those with higher levels of performance, possibly as a benefit or as part of some compensation scheme. One obvious take away of such an approach is that any positive association between workplace

flexibility and outcomes could be mistakenly attributed to the flexible work option itself when in fact the positive association may instead simply signal that the highest performing individuals gained access to it. Indeed, in this case, the causality would be running in precisely the opposite direction – employees who are most productive are the ones offered the flexible work arrangement.

The way in which a policy is implemented, not just the policy itself, can influence outcomes as well (Van Deusen, James, Gill, & McKechnie, 2007). Researchers studying the policy and not the way in which it is implemented may be missing a key factor in the success (or failure) of the intervention. For example, the employee's perception of how his or her employer views workplace flexibility could matter. If an employee believes, despite a formal written policy or statement of support, that there might be negative repercussions to taking advantage of a flexible work arrangement, such as a negative reaction by a supervisor or a reduction in bonus pay, the employee may be less likely to take advantage of the option. The opposite may be true as well. Take-up rates may be higher if employers encourage the use of flexible work options. Researchers may therefore attribute a positive outcome to the availability of flexible work options only, but the relationship may depend crucially on both the existence of an initiative of this type and the employer's support for it.

The studies in the literature are also subject to common limitations that might restrict their generalizability to other employees and employers. These include insufficient sample size, non-representativeness of the employer and employees, non-response, poor data reliability, and the failure or inability to implement sufficient statistical analyses to control for confounding factors. The ideal way to address the host of empirical issues identified above is to conduct a study with random assignment to treatment (availability of a TPM option) and control groups (no

availability) and to follow these two groups over time. The initiative upon which this paper is based was designed to do just that.

III. Data

Data for this study come from a large regional medical provider in the United States ("ModMed") as part of a project funded by the Sloan Foundation through the Sloan Center on Aging & Work at Boston College, and supplemented with data from the Health and Retirement Study (HRS), a large, nationally-representative longitudinal dataset of older Americans. Regarding the ModMed data, a team of researchers from Boston College worked with ModMed to implement a TPM initiative using an experimental design. The purpose of the study was to assess the causal impact of the initiative on business-relevant outcomes at both the employee and work unit levels. The study began with a one-year discovery process that involved an extensive literature review, an examination of best practices at award-winning hospitals, telephone interviews with 15 randomly-selected managers, and focus groups with 40 randomly-selected employees in 10 job categories, as well as discussions with leadership at ModMed.

Based on the information obtained during the discovery process, the researchers at Boston College and the leadership at ModMed constructed an initiative that encouraged formal discussions between employees and managers about their work schedules. Prior to the discussion, employees were asked to participate in an on-line training course and complete a self-assessment form that asked the employee to reflect on the impact of any requested schedule change to their own work, to the work unit, and to the organization. Similarly, managers were encouraged to implement schedule changes determined to be both beneficial to the employee and, at a minimum, not detrimental to either the work unit team members or the organization.

Some examples included allowing an employee to leave early from time to time, setting a different routine schedule, and working remotely. The pilot initiative was launched in December 2012.

Data collection efforts began with a baseline survey of all employees in September 2012 and ended with a final survey in January 2014, slightly more than one year after the initiative was launched. Employees and managers were invited to participate in two additional surveys in March 2013 and September 2013, and mangers were invited to participate in three check-in surveys (January 2013, June 2013, and November 2013). The surveys contained detailed information about demographic, economic, and job characteristics and, importantly for this study, employees' and managers' expectations about continued work at ModMed and retirement.

A total of 8,270 employees and 646 managers were invited to participate in the ModMed surveys, and 5,244 (63%) employees and 517 (80%) managers completed at least one survey. Response rates in each individual wave ranged from 32 percent to 43 percent among employees and from 28 percent to 63 percent among managers. The highest response rates were associated with the baseline survey.

Our analysis focused on retirement transitions from career employment. We, therefore, restricted our analyses to ModMed employees who were aged 50 and older, as job transitions prior to that age would unlikely be considered transitions out of the labor force. We defined a full-time career (FTC) job at ModMed as one that consists of 30 or more hours per week ("full time") and one that has lasted at least five or more years ("career"). An established definition of FTC employment in the retirement literature is 1,600 or more hours per year and 10 or more years of tenure. Our definition of hours is consistent with that in the literature, while our tenure requirement is less stringent. We use the lower tenure requirement to maintain sufficient sample

sizes for our analyses, although we do perform a sub-analysis, described below, using the 10-year requirement. In any case, the retirement literature has established that retirement transitions are fairly robust to reasonable alternative definitions of career employment, of which a 5-year tenure requirement can be considered (Cahill, Giandrea, & Quinn, 2006). Approximately one third of employees and more than 4 out of 10 managers were aged 50 or older at the time of the first interview and 58 percent of employees and 68 percent of managers had five or more years of tenure with ModMed.

For purposes of comparison, we also examine the retirement patterns of a national sample of older Americans using the Health and Retirement Study (HRS). The HRS began in 1992 with an initial sample of 12,652 individuals aged 51 to 61 and their spouses, regardless of age, from approximately 7,600 households (Juster & Suzman, 1995; Karp, 2007). The HRS interviews are biennial and data are currently available through 2012. Additional cohorts of older Americans aged 51 to 56 at the time of their first interview were added in 1998 (the "War Babies;" n=2,529), 2004 (the "Early Boomers;" n=3,330), and 2010 (the "Mid-Boomers;" n=4,992). The HRS questionnaires contain detailed information about work and retirement decisions, as well as the demographic and economic characteristics of respondents, and are, therefore, an ideal source of data for making comparisons to the ModMed data. Similar to the ModMed sample, we focus on HRS Core respondents who were on a FTC job at the time of the first interview. We use the HRS Core cohort in particular because this group has by and large completed the transition from work to retirement by 2012.

IV. Randomization of work units

A key feature of the evaluation of the TPM initiative was the random assignment of work units to treatment and control groups. The process by which work units were randomly assigned

was complicated by the ways in which work units are organized within the hospital system. While approximately one quarter of the work units eligible for this study had a straightforward organizational structure, with all employees in the work unit reporting directly to one (and only one) manager, most work units are not organized this way.[iv] Many work units contained multiple managers and many managers oversee employees in multiple work units. This interconnected structure of work units at ModMed presented clear contamination issues with respect to an unconditional random assignment of work units to treatment and control groups.

To address links across work units, we grouped work units into self-contained independent clusters of managers and employees. Links across work units were documented using a de-identified employee-level administrative dataset of all ModMed employees and managers as of August 21, 2012. The dataset contained 399 unique work unit numbers (e.g., "8301–Housekeeping"). Work units performing similar tasks at different locations had identical four-digit work unit numbers and were distinguished by an additional location identifier. Per our discussions with ModMed, we considered work units with the same work unit number but in different locations as separate work units. Taking work unit location into account, ModernMedical contained a total of 608 unique work unit-location observations.

Of the 627 managers in the administrative dataset, 180 were managers of managers, leaving 451 managers of employees only.[v] Focusing on managers of employees only simplified relationships across work units greatly, and allowed for the identification of self-contained manager-work unit clusters. Removing managers of managers also reduced the number of work units available for the analysis, from 608 to 464, as the supervisors in many of the smaller work units were managers of managers.

To identify unique manager-work unit clusters, we converted the employee-level administrative dataset into a manager-work unit level dataset (i.e., each manager-work unit combination contributed one observation). We then ran various loop procedures in which each manager-work unit observation in the dataset was compared with the others to see if a link existed due to either a common manager or a common work unit. If a link existed, the manager-work unit observations were put into the same cluster. A total of 172 independent manager-work unit clusters were identified in the dataset. The majority of these independent clusters contained one work unit and one manager (n=107; 62%).

Five of the 172 independent manager-work unit clusters contained large numbers of work units, employees, or both. These large clusters were broken into smaller ones by removing work units with 50 employees or more, which greatly reduced the connections across work units. This last adjustment increased the number of independent manager-work unit clusters to 191. These 191 independent manager-work unit clusters identified for randomization contained 439 work units. Therefore, a total of 169 work units (169 = 608 – 439) were not included in our randomization pool because of ties between managers and employees across work units.

The assignment of work units to the treatment and control groups was based on a random number (between zero and one) that was assigned to each work unit via its cluster. All work units, with the exception of the four largest clusters,[vi] were ranked by this random number and assigned to treatment and control groups according to its percentile within the distribution. With the exception of the four largest clusters, work units below the 60th percentile were assigned to the treatment group and work units higher than the 60th percentile were assigned to the control group, using a 60-40 split of work units to increase the number of work units assigned to the experimental group.

The randomization procedure yielded 260 work units in the treatment group and 179 work units in the control group. While the selection of work units into the treatment group was random, randomization does not necessarily imply perfectly-matched distributions with respect to demographic and job characteristics. Differences could occur by chance. Comparisons of treatment and control work units, and those not assigned to either group, reveal that the differences across the three groups at the outset of the study were relatively minor (Exhibits 1, 2a, 2b; Appendix A, B).[vii]

V. Measuring retirement transitions

Retirement transitions are defined as a transition from state S to state Q, $S \rightarrow Q$, where S is defined as full-time employment with ModMed and Q is defined as the first transition from full-time employment. Q can be a transition to phased retirement (a sizable reduction in hours with ModMed), a transition to a bridge job (work with a new employer, either part-time or full-time), or a direct exit from the labor force (retirement).

The probability of an individual in the treatment group transitioning from state S to Q can be expressed as follows: $PR(S \rightarrow Q|\vartheta = T, t) = \frac{\sum_i \ 1(i \in Q_{T,t} \cap i \in S_{T,t-1})}{\sum_i \ 1(\ i \in S_{T,t-1})}$, where i refers to individual; ϑ is an indicator for being in either the treatment (T) or control (C) group; $Q_{T,t}$ refers to the set of treatment group individuals in state Q at time t; $S_{T,t}$ refers to the set of treatment group individuals in state S at time t-1; and $1(\cdot)$ is an indicator function (Gorodnichenko, Song, & Stolyarov, 2013). Similarly, the probability of an individual in the control group transitioning from state S to Q is: $PR(S \rightarrow Q|\vartheta = C, t) = \frac{\sum_i \ 1(i \in Q_{C,t} \cap i \in S_{C,t-1})}{\sum_i \ 1(\ i \in S_{C,t-1})}$. Therefore, the difference

between the probabilities of transitioning from state S to Q between the treatment and control groups at time *t* can be expressed as follows: $PR(S \rightarrow Q|\vartheta = T, t) - PR(S \rightarrow Q|\vartheta = C, t)$.

To take into account the possibility that differences between the treatment and control groups may have arisen by chance, both with respect to the initial random assignment and with respect to attrition across waves, we estimate the following model using person-wave observations:

$$PR\left(S \rightarrow Q\middle|X_{ijt}, \vartheta_i, t\right) = \beta_0 + \beta_1\vartheta_\mathrm{i} + \beta_2\mathrm{W_t} + \beta_3(\vartheta_\mathrm{i} * \mathrm{W_t}) + \beta_4\mathrm{X_{ijt}} + \beta_5\mathrm{X_{jt}} + \alpha_\mathrm{i} + \gamma_\mathrm{j} + \varepsilon_\mathrm{ijt} \quad (1)$$

where $PR\left(S \rightarrow Q\middle|X_{ijt}, \vartheta_i, t\right)$ denotes a transition from state S to Q for person *i* in work unit *j* at time *t*; ϑ_i denotes a dichotomous indicator for whether employee *i* belongs to the treatment group; W_t denotes the data wave, *t*; X_{ijt} denotes a vector of employee characteristics and X_{jt} denotes a vector of work unit characteristics; α_i denotes an individual specific effect and γ_j denotes a work unit specific effect; and ε_{ijt} is an independent, identically distributed error term. In this model, β_1, captures any systematic differences between individuals in the treatment and control groups; β_2 captures time trends across both treatment and control groups, and β_3 captures the treatment effect; that is, changes over time between individuals in the treatment group relative to those in the control group, controlling for treatment-control differences at baseline, time trends, and all other variables included in the model.

Information about work and retirement expectations among ModMed respondents is obtained from two general questions about work expectations. The first question asks, "How long do you think you will continue work for [ModMed]?" and the second asks, "Thinking ahead 5 years, what do you expect your situation will be?"[viii] Viewed from the context of older career workers, the questions can be used to assess their expectations about retirement transitions. More specifically if, in response to the first question, individuals report that they plan to work at

ModMed "indefinitely" or "until retirement," this response can be interpreted as an expectation of making a direct exit from the labor force following their employment at ModMed. Similarly, older ModMed career workers who plan to work for a new employer following their employment with ModMed are expecting to transition to a bridge job.

The second question can also be used to ascertain expectations about bridge employment, albeit in the next five years. Older ModMed career workers who say they plan to be working at ModMed in their current job in five years can be classified as not planning to make a transition from FTC employment in this time period. Those older career workers who plan to be working at a new part-time job within ModMed can be classified as expecting some form of phased retirement in the next five years. Those planning to work for a new employer in five years – either full-time or part-time – can be classified as taking a wage-and-salary bridge job, while those planning to be self-employed or owning a business in five years can be classified as taking a self-employed bridge job. Finally, those expecting to be out of the labor force or retired in five years can be classified as making a direct exit following their employment with ModMed.[ix]

In contrast to the ModMed questions about expectations regarding retirement, data from the longitudinal Health and Retirement Study can be used to construct actual work histories. We begin by selecting a group of HRS Core respondents who were on a FTC job at the time of their first interview in 1992, and then examine each respondent's first transition from career employment to assess the prevalence of bridge job transitions and direct exits from the labor force. We also focus on a subgroup of HRS respondents who were in the professional services industry, which includes healthcare, as a point of comparison for the ModMed respondents' expectations about job transitions later in life.

VI. Results

As noted above, work units were assigned to treatment and control groups randomly via independent manager-work unit clusters. Of the 608 work units that existed at ModMed as of August 2012, 260 (43%) were assigned to the treatment group, 179 (29%) were assigned to the control group, and 169 (28%) were not randomized (Exhibit 1). The treatment group included 3,256 employees and 287 managers and the control group included 2,595 employees and 200 managers. Work units did not differ significantly by treatment and control status with respect to the location of the work unit within the hospital system or work unit size. Treatment and control work units did differ somewhat by clinical and non-clinical status, by chance, with the fraction of treatment units classified as being clinical lower than that of the control group work units (49% compared with 58%). This difference highlights the importance of using multivariate techniques to control for treatment-control differences despite random assignment.

A comparison of employees and managers from the administrative database used for random assignment and in the baseline survey reveals minimal differences with respect to gender, age, and location within the hospital system (Exhibits 2a,b). Employees who responded to the baseline survey were slightly older than those in the administrative dataset (35% and 31% were aged 50 or older, respectively) and employees in the baseline survey were slightly more likely to come from area Metro 1 (65% and 60%, respectively). Among managers, respondents to the baseline survey resembled those in the administrative dataset with respect to gender, age, and location.

The response rate to the baseline survey was 63 percent (n = 405) among managers and 43 percent (n= 3,545) among employees (Exhibit 3). Attrition across waves was a challenge during the study, as was the initial response. While ModMed often receives response rates of 75 percent or higher on their internal near-annual Employee Opinion surveys, employees and

managers are strongly encouraged to participate in those surveys by ModMed leadership. The Boston College survey, subject to Institutional Review Board approvals at both institutions, could not rely on such signals from leadership in order to avoid the impression of undue influence on the part of the an employer. Still, without such encouragement, 63 percent of employees and 80 percent of managers responded to at least one survey between September 2012 and January 2014. At the time of the last survey, approximately one third of employees (32%) and more than one quarter of managers (28%) responded. The drop off in responses over the survey period highlights the importance of the person-wave analysis to make the most of the longitudinal data collected for the study.

A total of 660 employees and 108 managers who responded to the baseline survey were aged 50 years or older and on a FTC job in September 2013. The pooled sample of older FTC employees and managers were distributed across the treatment and control groups as follows: 292 (38%) in the treatment group, 244 (32%) in the control group, and 232 (30%) not randomized (Exhibit 4). At baseline the treatment and control groups were similar with respect to age, health status (physical and mental), educational attainment, ethnicity, marital status, household income, work status of spouse, and dependents (children, elders), as might be expected given random assignment. Further, at baseline the pooled sample was more or less evenly divided across three groups of tenure: 5 to 10 years; 10 to less than 20 years; and 20 or more years (Exhibit 5). Respondents in the control group, however, were somewhat less likely than those in the treatment group to have lower levels of tenure (28% of the control group participants had 5 years to less than 10 years, compared with 34% of the treatment group), but not significantly so. Approximately three quarters of older FTC workers at ModMed were paid hourly, largely concentrated among the employees (see Appendix B). Nearly half of older FTC

workers typically worked 40 hours per week, with slightly less than one quarter working between 30 and 39 hours per week, and slightly more than one quarter typically working more than 40 hours per week. Most (60%) of older FTC workers had interactions with patients and less than 1 in 10 had a second job. No statistically significant differences existed by treatment-control status with respect to these attributes.

Our first finding with respect to job transitions among FTC workers at ModMed is that the vast majority of older workers – nearly eight out of ten - plan to remain on their FTC job within the next five years (Exhibit 6). Of those who plan to make a transition, 40 percent of the men and 27 percent of the women plan to transition to some form of bridge employment. Using the work expectations question that is not conditional on a timeframe, we find that approximately 18 percent of the men and 11 percent of the women plan to transition to a bridge job prior to exiting the labor force completely; that is, between 80 percent and 90 percent of ModMed's older workers plan to retire directly from ModMed, without a change in employer. These percentages for bridge job prevalence are substantially lower than those reported in the bridge job literature.

To explore this issue further, we compare the ModMed sample to the HRS Core respondents. As noted above, in order to make comparisons with the ModMed sample, we include only age-eligible HRS respondents who were on a full-time career (FTC) job at the time of the first interview, where a FTC job is defined as one with 1,600 hours per year and 10 or more years of tenure. Further, to make the HRS sample analogous to the ModMed sample, we include HRS respondents working on a wage-and-salary career job. Then, for each of the HRS respondents, we determine which respondents remained in FTC employment (or who were last observed on the FTC job), moved to a new job with a new employer, or exited the labor force directly from career employment.

Consistent with the retirement literature, we find that approximately one half of the career wage-and-salary workers who transitioned from FTC employment moved to a bridge job (Exhibit 6). Notably, job transitions involving a period of labor force exit of two years or more (sometimes referred to as "reentry") are not included as bridge job transitions; if reentrants were included among these transitions the fraction of individuals exiting directly from FTC employment would be even lower, further contrasting the HRS sample with the ModMed sample. Also not included in the HRS bridge job percentages are phased retirements. This exclusion is consistent with how we treat reductions in work hours among the ModMed sample.

We then restrict the HRS analysis to job transitions that took place in the first three waves (six years) of the first HRS interview to be consistent with the ModMed question about job transitions in the next five years. We find that the prevalence of bridge job transitions among those who made a transition from FTC employment is slightly higher (54% for men; 52% for women) than the percentages obtained using the entire 1992 to 2012 time period. Bridge job transitions among the HRS group of respondents increase even further when the sample is restricted to those in the professional services industry on the career job, which includes health care workers (offices of physicians, dentists, chiropractors, optometrists, and health practitioners; hospitals; nursing and personal care facilities; and health services). The results of the HRS analysis indicate that the retirement expectations older career workers at ModMed differ from the retirement patterns of older workers nationally.

While older career workers at ModMed are less likely to transition into bridge jobs than older Americans nationally, the key question for our analyses is whether the randomly-assigned initiative had a statistically-significant impact on retirement expectations. To address this question we compare the retirement expectations of those in the treatment and control groups

between baseline (September 2012) and Time 7 (January 2014). We find that the percentage of older workers in the treatment group expecting to switch to a bridge job in the next five years declined from 24 percent at baseline to 20 percent at Time 7 (Exhibit 7). Among the control group, the percentage expecting to switch to a bridge job increased from 26 percent to 32 percent, or a 14 percentage-point difference between the treatment and control groups. When looking beyond five years, we find that, among the treatment group, the prevalence of expecting to take a bridge job remained more or less unchanged over the observation period (a modest decline from 86% to 84%), whereas among the control group the prevalence of expecting to switch to a bridge job increased from 14 percent to 21 percent. One interpretation of these findings, in light of random assignment, is that members of the treatment group were less likely to consider bridge employment–and more likely to remain with ModMed until retirement–as a result of the initiative.

As noted above, differences between the treatment and control groups could have occurred by chance despite random assignment and differences could have occurred over time through attrition over the observation period. To address this concern, we pool the longitudinal data into person-wave observations and estimate a series of multinomial logistic regression models following Equation (1) above. We use a three-way outcome variable based on the respondent's expected labor force status in five years: 1) still on their FTC job, 2) moved to a bridge job, and 3) exited the labor force directly. For the purpose of this analysis, the bridge job category includes both transitions to wage-and-salary employment as well as self-employment. All coefficients are transformed into relative risk ratios for ease of interpretation, with those remaining in FTC employment as the base category, and estimated using robust standard errors and clustering at the individual level.

We estimated a series of models that differ with respect to the inclusion of individual characteristics (age, gender, health status, educational attainment, dependent care, manager status, hours worked, tenure) and work unit characteristics (clinical, number of employees, and age composition of employees) (Exhibit 8). Most of the key predictors of transitions are intuitive, with age, gender, health status, educational attainment, and dependent care being statistically significant predictors of retirement expectations and with relative risk ratios in the expected direction (i.e., less than or greater than one). By and large, the work unit level characteristics were not significant predictors of retirement expectations, all else equal. The coefficients of interest–the interactions between treatment-control status and wave–reveal a statistically significant difference with respect to direct exits between the treatment and control group at Time 5 (September 2013), across all three model specifications. The models also reveal a general time trend within the organization, with a general increase in expected direct exits from the labor force. This result could be good news for the organization, as it could signal that fewer individuals desire to change employers later in life and exit directly. It could also mean, however, that individuals prefer to shorten the time they plan to work at ModMed, regardless of whether they transition to bridge employment.[x]

VII. Discussion

This study incorporates an experimental design with random assignment to ascertain if a TPM initiative is causally related to work and retirement expectations. The analyses for this paper stem from a three-year research project conducted between June 2011 and June 2014 at a regional hospital system in the U.S. with more than 9,000 employees. The data collection effort consisted of a series of longitudinal surveys that allowed us to identify treatment effects both descriptively and in a multivariate context.

We selected a group of full-time career (FTC) workers aged 50 or over at the time of the baseline survey and found that the TPM initiative affected the retirement expectations of ModMed workers. Specifically, relative to those in the control group and after one year, older workers in the treatment group were more likely to expect to remain working at ModMed through retirement without a change in employer. The treatment-control difference was not statistically significant in the last survey wave, possibly due to sample sizes or an actual dissipation of the impact.

This study has several implications for public policy. The primary objective of the analyses was to explore whether workplace flexibility arrangements can be used to support older workers who need to and want to continue their involvement in career employment. The results indicate that an effective TPM initiative can change employees' expectations about making a job change later in life. This finding is consistent with the retirement literature in which studies have noted that one reason for the high prevalence of bridge employment could be workers' preferences for flexibility that cannot be met by their career employer, due to regulatory barriers or some other reason.

Another important aspect of this study is the fact that the initiative did not involve large-scale changes within the organization. In fact, we found quite the opposite. The initiative centered around a constructive conversation between an employee and her manager, and a mutually-agreeable response, if such an option existed. Of course, some set-up costs were incurred in order for those conversations to be constructive, including a training module for employees that included a tool for self-assessment and another for managers that included guides for constructive conversations about time and/or place and response options approved by the organization. Relative to the impact on employees, as identified through other analyses

examining the impact of the initiative on work-life balance (James, Pitt-Catsouphes, Cahill, et al., 2014), it appears that these costs are minimal relative to the expected benefits. Another essential component of the initiative was the buy-in of leadership at the organization, which gave managers the authority to adjust schedules.

Several limitations of the study are worth noting. First, the follow-up period for the analyses was about one year, from December 2012 to January 2014, with the baseline survey taking place in September 2012. To the extent that the effects of the initiative take time to be revealed, those that we identified may understate the long-term effects. Alternatively, if the results of the initiative fade over time, then our results could be viewed as an upper bound. Indeed, the fact that the treatment effect appeared to dissipate in the final wave may be evidence that the effects could fade. Our take is that the organization can play a role in which of these two outcomes is likely. By being active and continuing to promote communication between employees and managers, the organization may be able to ensure that any effects of the initiative are long lasting. Alternatively, if the organization is passive and the initiative is viewed as a one-time event, it is likely that any effects will dissipate over time.

The attributes of the hospital system and its innovative leadership that supported this initiative raises a legitimate concern about the representativeness of our findings, and the extent to which the results can be reasonably expected for another organization. While there are many factors that make the organization and its employees unique, such as the culture of the community it serves, lack of a unionized workforce, and the relatively short commute times of its employees and managers–a potentially important stress factor–one could argue that our findings might not hold for other organizations or other areas of the country. While such criticism is valid we note that the randomized design of the study implicitly controlled for these factors.

The fact that the organization is a hospital system could also be raised as an issue. Hospitals are unique in many respects, not least of which is that a profit motive might not be the primary goal of the organization's existence. Patient well-being and commitment to the community at large are factors that might play a role in hospitals and not in for-profit institutions, at least not as a primary objective. Government intervention, with respect to both the regulatory environment and with respect to payments and reimbursements for procedures among the Medicare and Medicaid patient populations and private health insurance all play a role in how hospitals function, further complicating the extent to which the findings from this study might be indicative of what can be expected at another organization. That said, the fact that hospital systems are complex environments, and that the relationships across work units are interlinked, and the fact that a straightforward initiative was successful with identifiable treatment effects could be informative to other organizations.

Regarding the analysis itself, our primary outcome variable of interest is retirement expectations, clearly a subjective assessment that may or may not end up matching the individual's actual work history. Not only can an individual's expectations change because of time-varying preferences for work and leisure, but expectations might change due to a host of unforeseeable events. Indeed, research from EBRI's Retirement Confidence Survey (RCS) indicates that while approximately two thirds of workers plan to work for pay after retirement, less than one third actually do (Helman, Adams, Copeland, & VanDerhei, 2014). One important note about this critique, however, is that the expectation variable is still meaningful as a signal about actual outcomes as long as the relationship holds over time. The difference between expectations about work and retirement and actual work after retirement has been more or less constant over time in the RCS (1998 to 2014), implying that changes in expectations can be

indicative of changes in actual outcomes. To the extent that our study reveals changes in expectations, one might also expect to see at least some change in actual choices as time progresses. Of course, such determinations cannot be confirmed until the actual retirement process of the ModMed employees have been made.

VIII. Conclusion

One topic that has remained elusive for researchers is the causal impact of workplace flexibility arrangements on work and retirement decisions. The vast majority of studies that have examined the relationship between flexible work arrangements and employee and business outcomes have primarily identified associations as opposed to a causal link. This study provides evidence that a well-designed workplace flexibility initiative can impact work and retirement expectations.

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[i] The TPM project focused on three categories of workplace flexibility: the scheduling of work, the number of hours designated for work, and the place(s) where work is done. The term "Time and Place Management" reflects increases in the choice and control that employees and their supervisors have with regard to when, where, and how work gets done.

[ii] A small fraction of employees at the organization were not invited to participate, including physicians, whose schedules are assigned separately from other individuals within the organization, out-of-state employees, and employees in remote locations, where a limited number of employees meant that random assignment was not feasible.

[iii] The objective productivity data is being analyzed as part of another study on the impact of the TPM initiative on turnover and churn within work units during the observation period and on the financial performance of work units.

[iv] A manager, based on the ModMed administrative database, is defined as any individual who has one or more employees reporting to them. Of the 9,270 employees in the database, 627 were managers.

[v] The sample sizes from the administrative database differ slightly from the number of employees and managers who were invited to participate in the study. The discrepancy is due in part to changes in the organization between the date of the administrative file and the date the baseline survey was launched; the discrepancy is also due in part to the fact that employees from locations outside of the four main locations of interest were invited to participate in the survey.

[vi] The four largest clusters – containing 38, 32, 21, and 17 work units – were randomized to treatment and control groups separately in order to prevent, by chance, a lopsided assignment of work units to either the treatment or control group. For the two largest clusters, one was randomly assigned to the treatment group and the other one was assigned to the control group. Similarly, for the third and fourth largest clusters, one was randomly assigned to the treatment group and other one was assigned to the control group. The outcome of this procedure meant that both the treatment and control groups would be guaranteed one of the top two largest clusters and one of the third and fourth largest clusters.

[vii] The distribution of work units by treatment and control status is similar with respect to work site. Treatment and control work units do differ somewhat from those not randomized with respect to work unit size, as those not randomized were more likely to be smaller work units. The reason is that many of the smaller work units were tied to other work units through the web of manager-employee relationships within the hospital system and were, therefore, excluded from the randomization process because of potential contamination issues.

[viii] Response options for the question, "How long do you think you will continue working for [ModMed]?," are: 1) five years or less (I will probably leave before I retire); 2) more than five years (but I will probably leave before I retire); 3) until I retire; and 4) indefinitely, I do not plan to retire. Response options for the question, "Thinking ahead 5 years, what do you expect your situation will be?," are: 1) working at my current job at ModMed; 2) working at a new full-time job at ModMed; 3) working at a new part-time job at ModMed; 4) working at a new full-time job with another organization; 5) working at a new part-time job with another organization; 6) working as a temporary worker hired for projects; 7) self-employed/independent contractor or consultant; 8) operating my own business; 9) full-time homemaker; 10) retired; and 11) out of the labor force for another reason.

[ix] It is conceivable that some individuals who report that they will be out of the labor force in five years might also plan to transition to another employer prior to exiting the labor force. We use the information from the first retirement-related question – in particular, the expectation of being at ModMed for less than five years with a change in employer – to reclassify these individuals as expecting to make a bridge job transition.

[x] We also estimated a series of logistic regression models based on the question about how long an individual plans to work at ModMed, with the outcomes "indefinitely" and "until retirement" coded as one and "<5 years (with a change in employer)" and ">5 years (with a change in employer)" coded as zero. The resulting coefficients, therefore, correspond to the likelihood of a direct exit from the labor force. These models, however, did not produce statistically-significant treatment and control group differences.

Exhibit 1. ModMed work unit characteristics by treatment-control status[1]

Characteristic	All	Treatment	Control	Not randomized
Sample				
number of work units	608	260	179	169
percentage	100	43	29	28
percentage (T/C only)		59	41	
number of employees[2]	8,331	3,256	2,595	2,480
percentage	100	39	31	30
percentage (T/C only)		56	44	
number of managers[2]	619	287	200	132
percentage	100	46	32	21
percentage (T/C only)		59	41	
Work unit site (%)				
Metro 1	53	59	56	43
Metro 2	28	21	24	42
Suburban	12	13	13	9
Rural	7	7	7	7
Work unit size (%)				
1-4	33	27	24	53
5-9	24	25	23	22
10-19	19	22	23	8
20-49	18	23	23	3
50-74	4	1	5	8
75-99	2	1	1	5
100-155	1	0	1	2
Work unit clinical status (%)				
Clinical	53	49	58	na
Non-clinical	40	43	36	na
Other	7	8	6	na

Note:

[1] This analysis of the administrative data excluded physicians, "flex" workers, out-of-state employees, and employees in rural locations with few employees.

[2] The sample sizes shown here from the administrative database differ slightly from the number of employees and managers who were invited to participate in the study (see Exhibit 2). The discrepancy is due in part to changes in the organization between the date of the administrative file and the date the baseline survey was launched; the discrepancy is also due in part to the fact that employees from locations outside of the four locations of interest were invited to participate in the study.

Source: ModMed Administrative Dataset, dated August 21, 2012.

Exhibit 2a: ModMed employee characteristics by treatment-control status and data source

	Administrative File				Boston College Baseline Survey			
Characteristic	All	Treatment	Control	Not randomized	All	Treatment	Control	Not randomized
Sample								
number	8,331	3,256	2,595	2,480	3,545	1,397	1,141	1007
percentage	100	39	31	30	100	39	32	28
percentage (T/C only)		56	44			55	45	
completed full survey					3,000	1,179	970	851
percentage					85	33	27	24
percentage (T/C only)						55	45	
Gender (%)								
Female	80	78	84	79	81	82	83	79
Male	20	22	16	21	16	15	15	18
Missing					3	3	2	4
Age (%)								
<30	21	18	21	24	15	15	14	14
30-39	27	26	28	28	24	24	26	24
40-49	22	23	21	20	22	23	22	22
50-59	22	23	20	21	25	24	25	28
60+	9	9	9	7	10	10	10	9
Missing					4	4	4	4
Location (%)								
Metro 1	60	61	50	67	65	65	65	63
Metro 2	23	19	37	15	20	21	18	22
Suburban	13	16	8	17	12	11	13	12
Rural	3	4	5	1	3	4	3	3

Note: This analysis of the administrative data excluded physicians, "flex" workers, out-of-state employees, and employees in rural locations with few employees.

Sources: ModMed Administrative Dataset, dated August 21, 2012; The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 2b: ModMed manager characteristics by treatment-control status and data source

	Administrative File				Boston College Baseline Survey			
Characteristic	All	Treatment	Control	Not randomized	All	Treatment	Control	Not randomized
Sample								
number	619	287	200	132	405	148	132	125
percentage	153	71	49	33	100	37	33	31
percentage (T/C only)		59	41			53	47	
completed full survey					325	116	110	99
percentage					100	36	34	30
percentage (T/C only)						51	49	
Gender (%)								
Female	70	65	74	74	71	71	71	73
Male	30	35	26	26	23	22	24	24
Missing					6	8	5	3
Age (%)								
<30	3	2	4	4	3	3	2	3
30-39	22	20	26	23	23	25	23	22
40-49	32	36	32	25	27	29	28	23
50-59	33	33	31	35	32	31	32	32
60+	10	9	9	13	12	8	13	15
Missing					3	3	3	4
Location (%)								
Metro 1	71	68	71	77	71	71	68	74
Metro 2	15	15	19	11	15	16	13	15
Suburban	10	10	9	11	11	12	12	10
Rural	4	7	2	1	3	1	7	1

Note: This analysis of the administrative data excluded physicians, "flex" workers, out-of-state employees, and employees in rural locations with few employees.

Sources: ModMed Administrative Dataset, dated August 21, 2012; The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 3: Summary of ModMed survey participation, baseline (BL) through time seven (T7), by manager status and treatment-control status

		Employees				Managers			
Survey	n and %	All	Treatment	Control	Not randomized	All	Treatment	Control	Not randomized
Invited	n	8,270	3,278	2,646	2,346	646	229	219	198
	%	*100*	*40*	*32*	*28*	*100*	*35*	*34*	*31*
Baseline	n	3,545	1,397	1,141	1,007	405	148	132	125
	% of invited	*43*	*43*	*43*	*43*	*63*	*65*	*60*	*63*
T2	n	-------	-------	-------	-------	233	79	86	68
	% of invited	-------	-------	-------	-------	*36*	*34*	*39*	*34*
T3	n	3,115	1,206	1,045	864	271	96	95	80
	% of invited	*38*	*37*	*39*	*37*	*42*	*42*	*43*	*40*
T4	n	-------	-------	-------	-------	197	73	70	54
	% of invited	-------	-------	-------	-------	*30*	*32*	*32*	*27*
T5	n	2,710	1,027	911	772	201	71	69	61
	% of invited	*33*	*31*	*34*	*33*	*31*	*31*	*32*	*31*
T6	n	-------	-------	-------	-------	172	62	56	54
	% of invited	-------	-------	-------	-------	*27*	*27*	*26*	*27*
T7	n	2,641	1,039	844	758	179	62	64	53
	% of invited	*32*	*32*	*32*	*32*	*28*	*27*	*29*	*27*
Any	n	5,244	2,045	1,727	1,472	517	180	176	161
	% of invited	*63*	*62*	*65*	*63*	*80*	*79*	*80*	*81*
All	n	1,215	470	378	367	62	20	23	19
	% of invited	*15*	*14*	*14*	*16*	*10*	*9*	*11*	*10*
Number of surveys (%)									
	1	36	36	36	36	30	29	32	29
	2	23	24	23	22	18	16	14	23
	3	18	18	20	17	13	12	13	15
	4	23	23	22	25	12	13	14	7
	5	-------	-------	-------	-------	7	8	7	7
	6	-------	-------	-------	-------	8	10	7	7
	7	-------	-------	-------	-------	12	11	13	12

Notes:

[1] The numbers shown for each wave correspond to respondents who completed the survey in full or who completed the survey partially. Employees who terminated the survey (i.e., no consent) are not included as respondents.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 4: Demographic characteristics of FTC employees and managers at baseline, by treatment-control status

	FTC older employees and managers			
Characteristic	All	Treatment	Control	NR
Sample				
number	768	292	244	232
percentage	100%	38%	32%	30%
Gender (%)*				
Female	82	85	83	78
Male	18	15	17	22
Age (%)				
< 49	----	----	----	----
50-59	82	85	83	78
60+	18	15	17	22
Health status				
Physical (mean)	7.75	7.90	7.68	7.65
Mental (mean)	8.25	8.38	8.12	8.22
Education (%)**				
Less than HS	1	0	0	1
HS or GED	10	10	9	10
Some college	24	26	17	28
2-yr college degree	23	22	24	22
Bachelor's degree	24	25	28	18
Some grad school	6	5	4	9
Graduate degree	14	11	18	12
Ethnicity(%)				
White	94	95	94	92
Black	0	0	0	0
Hispanic	2	1	2	3
Other	4	3	4	5

Notes:

[1] FTC = Full-time career.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] *, **, *** indicates that differences by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 4 (*continued*): Demographic characteristics of FTC employees and managers at baseline, by treatment-control status

Characteristic	All	Treatment	Control	NR
Marital status (%)				
Single, never married	5	5	5	3
Living with partner	4	4	4	5
Married	68	68	66	70
Separated, divorced, or widowed	23	23	24	22
Annual household income				
< $39k	13	16	11	12
< $40k - $79k	40	40	39	43
< $80k - $119k	29	27	32	30
>=$120k	17	17	18	15
Work status of spouse (%)				
Not employed	24	22	25	28
Employed, full-time	62	66	61	59
Employed, part-time	10	9	11	11
Employed, other	3	3	4	2
Dependent children (%)				
Yes	15	11	18	16
No	85	89	83	84
Elder care (%)				
Yes	22	21	25	17
No	78	79	75	83

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] $^{*, **, ***}$ indicates that differences by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 5: Job characteristics of employees and managers at baseline, by treatment-control status

Characteristic	All	Treatment	Control	NR[1]
Manager				
Yes	14	12	15	16
No	86	88	85	84
Tenure (%)				
< 5years	-----	-----	-----	-----
5 years to less than 10 years	33	34	28	37
10 to less than 20 years	36	34	38	35
20 or more years	32	33	34	28
Paid hourly or salaried (%)				
Salaried	22	22	22	23
Hourly	77	78	77	76
Other	1	0	1	1
Hours worked per week (%)				
<30	-----	-----	-----	-----
30-39	22	20	26	21
40	48	54	41	49
41-49	16	14	19	16
50-59	9	8	10	11
60-69	3	3	2	3
70+	2	2	2	2
Interaction or contact with patients (%)				
Yes	60	56	64	59
No	40	44	36	41
Second job (%)				
Yes	8	8	7	10
No	92	92	93	90

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] $^{*, **, ***}$ indicates that differences by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Exhibit 6: Expected retirement transitions among older career workers, by treatment-control status

			Health and Retirement Study			
	ModMed		Wage-and-salary		Professional Services	
Characteristic	Men	Women	Men	Women	Men	Women
n	68	319	2,089	1,616	309	685
%	18%	82%	56%	44%	31%	69%
Next five (5) years[1]						
Remain on FTC job	78%	81%	53%	50%	56%	52%
FTC => bridge job	9%	5%	25%	26%	25%	26%
FTC => out of labor force	13%	14%	22%	24%	18%	22%
% with bridge job	*40%*	*27%*	*54%*	*52%*	*58%*	*54%*
Through retirement						
Remain on FTC job	------	------	------	------	------	------
FTC => bridge job	18%	11%	49%	49%	54%	50%
FTC => out of labor force	82%	89%	51%	51%	46%	50%

Note:

[1] The follow-up period is six years for the HRS sample.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative Baseline Survey.

Exhibit 7: Expected retirement transitions among older career workers, by treatment-control status

	Treatment group			Control group			
Characteristic	Baseline	Time 7	T7-BL	Baseline	Time 7	T7-BL	T-C Diff
Next five (5) years							
Remain on FTC job	68%	61%	-0.07	65%	61%	-0.04	-0.03
Phased retirement	7%	3%	-0.03	6%	4%	-0.02	-0.02
FTC => bridge job							
wage and salary	5%	6%	0.01	7%	10%	0.03	-0.03
self employed	1%	1%	0.01	1%	1%	0.00	0.01
FTC => out of labor force	19%	28%	0.09	21%	24%	0.02	0.07
% with bridge job	**24%**	**20%**	**-0.04**	**26%**	**32%**	**0.06**	**-0.09**
Through retirement							
Remain on FTC job	------	------	------	------	------	------	------
FTC => bridge job	**14%**	**16%**	**0.02**	**14%**	**22%**	**0.07**	**-0.06**
FTC => out of labor force	86%	84%	-0.02	86%	78%	-0.07	0.06
n	287	157		237	120		

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative Baseline Survey.

Exhibit 8. Relative risk ratios from a multinomial logistic regression of expectations about continued work at ModMed

	Specification #1				Specification #2				Specification #3			
	Bridge		Direct exit		Bridge		Direct exit		Bridge		Direct exit	
Variable	*RRR*	*p-value*	*RRR*	*p-value*	*RRR*	*p-value*	*RRR*	*p-value*	*RRR*	*p-value*	*RRR*	*p-value*
Treatment	0.70	0.293	0.83	0.386	0.92	0.804	0.85	0.534	0.79	0.570	0.82	0.529
Wave3	0.81	0.459	1.05	0.704	0.72	0.372	1.50	0.049 **	0.74	0.407	1.55	0.031 **
Wave5	1.05	0.858	1.12	0.445	0.94	0.877	1.67	0.027 **	0.94	0.858	1.71	0.022 **
Wave7	1.32	0.281	1.20	0.235	1.17	0.680	1.98	0.003 ***	1.16	0.688	2.03	0.002 ***
Treatment * Wave3	0.79	0.627	1.45	0.083 *	0.70	0.486	1.38	0.242	0.70	0.476	1.33	0.299
Treatment * Wave5	1.29	0.580	1.96	0.005 ***	1.08	0.873	2.25	0.007 ***	1.12	0.813	2.27	0.007 ***
Treatment * Wave7	1.05	0.910	1.44	0.126	1.04	0.942	1.34	0.320	1.09	0.861	1.32	0.353
Male					2.05	0.035 **	1.22	0.427	2.01	0.043 **	1.22	0.426
Age >= 62					1.25	0.611	17.11	0.000 ***	1.23	0.658	17.72	0.000 ***
Health status												
Top 40 percent					0.73	0.247	1.23	0.262	0.73	0.256	1.24	0.246
Middle					------	------	------	------	------	------	------	------
Bottom 40 percent					0.99	0.956	1.65	0.005 ***	0.98	0.952	1.62	0.007 ***
College degree					3.00	0.000 ***	1.21	0.337	3.01	0.001 ***	1.19	0.404
Dependent care												
Children					2.27	0.007 ***	0.40	0.016 **	2.20	0.009 ***	0.39	0.015 **
Adult					0.87	0.619	1.81	0.004 ***	0.80	0.453	1.80	0.003 ***
Manager					0.55	0.180	1.61	0.181	0.51	0.129	1.55	0.231
Hours worked												
30-40					------	------	------	------	------	------	------	------
41-49					1.27	0.457	0.72	0.200	1.31	0.398	0.77	0.270
50 plus					1.12	0.793	0.64	0.125	1.16	0.729	0.63	0.125
Tenure												
5-9 years					------	------	------	------	------	------	------	------
10 to 19 years					1.10	0.796	1.03	0.916	1.15	0.697	1.03	0.896
20 or more years					0.39	0.040 **	1.73	0.023 **	0.39	0.040 **	1.76	0.021 **
Clinical work unit									1.29	0.544	0.85	0.565
Number employees in work unit												
1-4									------	------	------	------
5-9									1.10	0.904	0.80	0.745
10-19									1.44	0.625	1.76	0.400
20+									0.85	0.824	1.81	0.355
Age distribution of work unit									0.69	0.218	0.85	0.447
Constant	0.11	0.000 ***	0.31	0.000 ***	0.05	0.000 ***	0.08	0.000 ***	0.06	0.007 ***	0.06	0.000 ***
n	1,960				1,913				1,913			
Psuedo R-squared	0.01				0.19				0.20			

Notes:

[1] *,**,*** indicates statistical significance at the 10-percent, 5-percent, and 1-percent level, respectively.

Source: Authors' calculations based on The Boston College Study of the ModernMedical Health System, Baseline Survey.

Appendix A: Demographic characteristics of employees and managers at baseline, by treatment-control status

	Employees				Managers			
Characteristic	All	Treatment	Control	NR[1]	All	Treatment	Control	NR[1]
Sample								
number	3,545	1,397	1,141	1,007	325	116	110	99
percentage	100	39	32	28	100	36	34	30
Gender (%)[**]								
Female	84	85	84	81	76	77	75	75
Male	16	15	16	19	24	23	25	25
Age (%)								
<30	15	16	15	15	3	4	2	3
30-39	25	25	27	25	24	26	23	23
40-49	23	24	23	23	28	30	29	24
50-59	26	25	26	29	33	32	33	34
60+	10	11	10	9	12	8	13	16
Health status								
Physical (mean)[##]	7.59	7.59	7.61	7.58	7.71	8.03	7.69	7.36
Mental (mean)[##]	7.96	7.97	7.97	7.94	7.96	8.38	7.86	7.57
Education (%)[*]								
Less than HS	0	0	0	1	0	0	0	0
HS or GED	8	8	7	8	3	5	1	4
Some college	25	25	22	27	13	14	13	11
2-yr college degree	23	23	24	22	10	10	9	12
Bachelor's degree	29	29	31	28	31	32	33	29
Some grad school	5	5	4	6	9	6	6	16
Graduate degree	10	9	11	10	33	33	37	27
Ethnicity(%)								
White	92	94	91	91	96	94	95	98
Black	0	0	0	0	1	1	1	0
Hispanic	3	2	4	3	1	1	2	1
Other	5	4	5	5	2	4	2	1

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] [*, **, ***] indicates that differences among employees by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

[4] [#, ##, ###] indicates that differences among managers by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Appendix A (*continued*): Demographic characteristics of employees and managers at baseline, by treatment-control status

	Employees				Managers			
Characteristic	All	Treatment	Control	NR[1]	All	Treatment	Control	NR[1]
Sample								
number	3,545	1,397	1,141	1,007	325	116	110	99
percentage	100	39	32	28	100	36	34	30
Marital status (%)[#]								
Single, never married	10	10	11	9	4	6	3	2
Living with partner	7	7	6	8	4	5	3	3
Married	68	68	68	68	77	81	75	76
Separated, divorced, or widowed	15	15	15	16	15	7	19	19
Annual household income[**]								
< $39k	23	24	20	23	3	4	4	1
< $40k - $79k	43	44	43	42	26	31	25	23
< $80k - $119k	24	22	26	27	38	35	42	38
>=$120k	10	10	11	9	32	30	29	38
Work status of spouse (%)								
Not employed	18	18	17	19	20	21	24	15
Employed, full-time	70	72	69	69	63	59	61	69
Employed, part-time	9	8	10	9	14	16	11	15
Employed, other	3	2	4	3	4	4	5	1
Dependent children (%)								
Yes	46	45	45	47	49	50	49	53
No	54	55	55	53	51	50	51	47
Elder care (%)								
Yes	13	13	13	13	11	12	6	16
No	87	87	87	87	51	88	94	84

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] [*, **, ***] indicates that differences among employees by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

[4] [#, ##, ###] indicates that differences among managers by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Appendix B: Job characteristics of employees and managers at baseline, by treatment-control status

	Employees				Managers			
Characteristic	All	Treatment	Control	NR[1]	All	Treatment	Control	NR[1]
Sample								
number	3,545	1,397	1,141	1,007	325	116	110	99
percentage	100	39	32	28	100	36	34	30
Position (%)[##]								
Managerial, information technology, clerical	30	30	29	30	65	75	56	62
Nurses, pharmacists, technicians, and assistants	44	45	45	42	13	10	15	16
Therapy and social work	3	3	3	4	2	1	1	4
Physical plant	1	1	1	1	0	0	0	0
Other	22	22	22	22	20	14	29	18
Employment status (%)								
Full-time	81	80	80	83	95	95	94	97
Part-time	18	19	19	17	4	4	5	3
Flex (PRN) or per-diem	0	0	0	0	0	0	1	0
Other	0	1	1	0	0	1	0	0
Paid hourly or salaried (%)								
Salaried	14	12	14	15	72	72	71	73
Hourly	86	87	86	84	27	28	27	26
Other	0	0	1	1	1	0	2	1
Tenure (%)								
Less than 6 months	4	4	4	5	1	2	0	1
6 months to less than 1 year	8	8	8	8	3	2	6	3
1 year to less than 3 years	20	20	20	19	19	24	17	14
3 years to less than 5 years	11	11	11	11	10	9	8	13
5 years to less than 10 years	26	26	25	27	22	25	19	22
10 to less than 20 years	21	21	21	21	29	23	34	29
20 or more years	10	10	10	9	17	17	16	18

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] $^{*, **, ***}$ indicates that differences among employees by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

[4] $^{\#, \#\#, \#\#\#}$ indicates that differences among managers by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.

Appendix B (*continued*): Job characteristics of employees and managers at baseline, by treatment-control status

	Employees				Managers			
Characteristic	All	Treatment	Control	NR[1]	All	Treatment	Control	NR[1]
Sample								
number	3,545	1,397	1,141	1,007	325	116	110	99
percentage	100	39	32	28	100	36	34	30
Hours worked per week (%)								
0-19	2	2	2	2	1	0	2	0
20-29	10	10	10	9	1	2	1	1
30-39	23	24	24	22	6	7	5	5
40	46	48	45	45	13	12	15	13
41-49	12	11	12	14	31	35	31	27
50-59	5	3	5	6	35	34	38	34
60-69	1	1	1	1	11	9	8	15
70+	1	1	1	1	2	1	0	4
Interaction or contact with patients (%)								
Yes	66	65	67	65	45	39	45	52
No	34	35	33	35	55	61	55	48
Second job (%)								
Yes	11	11	10	11	6	4	5	9
No	89	89	90	89	94	96	95	91

Notes:

[1] NR = Not Randomized.

[2] The statistical signficance of differences between groups was determined by a chi-square test in the case of categorical values and by ANOVA F-tests in the case of continuous variables.

[3] $^{*, **, ***}$ indicates that differences among employees by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

[4] $^{\#, \#\#, \#\#\#}$ indicates that differences among managers by treatment-control status were significant at the 10%, 5%, and 1% level, respectively.

Source: The Boston College Study of ModMed Health System, Pilot TPM Initiative.