An Innovative Approach to Resident Scheduling: Use of a Point-Based System to Account for Resident Preferences

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Abstract

Background The scheduling of residents for rotation assignments and on-call responsibilities is a time-consuming process that challenges the resources of residency programs. Assignment of schedules is traditionally done by chief residents or program administration with variable input from the residents involved.

Intervention We introduced an innovative point-based scheduling system to increase transparency in the scheduling process, foster a sense of fairness and equality in scheduling, and increase resident ownership for making judicious scheduling choices.

Methods We devised a point-based system in which each resident in our 40-member program was allocated an equal number of points. The residents assigned these points to their preferred choices of rotations. Residents were then surveyed anonymously on their perceptions of this new scheduling system and were asked to compare it with their traditional scheduling system.

Results The schedule was successfully implemented, and it allowed residents to express their scheduling preferences using an innovative point-based approach. Residents were generally satisfied with the new system, would recommend it to other programs, and perceived a greater sense of involvement. However, resident satisfaction with the new system was not significantly greater compared with the previous approach to scheduling ($P=.20$). Chief residents expressed satisfaction with the new scheduling model.

Conclusions Residents were equally satisfied with the traditional preference-based scheduling approach and the new point-based system. Chief residents' feedback on the new system reflected reduced stress and time commitment in the new point-based system.

Introduction

Creating an annual rotation and monthly call schedule is a necessary yet burdensome task for residency programs.¹ If not done well, the schedule is a source of resident dissatisfaction.² A traditional approach to scheduling is to solicit preferences from residents and then use a system of random allocation.³ Additional factors can then be added; for example, senior residents can be given preference over junior residents. Commercially available scheduling products, designed for industries that employ shift workers, utilize an innovative approach in which shifts are assigned a predetermined number of points, and workers select shifts based on the number of points each shift is valued.⁴ This approach has been used in other situations where there is a demand for limited resources, such as assigning students to highly

desired interview appointments.⁵ To date, this approach has not been described in the medical literature related to resident block or call scheduling.

We investigated the feasibility and acceptability of a point-based model for resident scheduling and compared it with a traditional preference-based model.

Methods

This study was undertaken in the academic year 2013–2014 at the MedStar Good Samaritan Hospital of Baltimore, Maryland, internal medicine program, which is a community-based program with 40 residents. In the prior traditional approach, residents would request months they desired to be assigned vacations or electives, and the chief residents would create an annual block schedule, trying to meet as many of these requests as possible. After the schedule was released, dissatisfied residents would often try to negotiate switches among themselves. Chief residents universally found the process of creating the overall schedule and then approving subsequent switches stressful and time-consuming.

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Editor's Note: The online version of this article contains the survey instrument and an example of how the point-based system was implemented.

We convened a focus group of faculty, chief residents, and residents to review the process. Weaknesses that were identified included lack of transparency in schedule creation, chief residents' failure to please everyone equally, lack of resident involvement and ownership, and inability to assign value to disparate priorities (academic versus personal).

We adapted a point-based scheduling system in which residents are allocated an equal number of points at the beginning of the academic year. Residents then assign points to preferred rotation blocks. For example, if a resident is planning to marry in June, she would allocate the maximum number of points for a June vacation. However, if another resident wants to attend her wedding but is equally interested in a September cardiology elective, she might split her points between the 2 requests. Residents could also assign points for the timing of required rotations, such as night float in October. To reduce complexity, residents were only able to express 1 such preference. A new allocation system was implemented prior to each month to create the monthly call schedule. For example, residents on the inpatient units or in the intensive care unit can designate preferred weekend work shifts.

Residents were prohibited from disclosing their point allocations to each other or exchanging points. Points are not rolled over from month to month or from year to year. Submission for requests could only be made in whole numbers, and the highest bidder was assigned the desired rotation. Details regarding implementation are provided as online supplemental material.

These data analyses were considered exempt by the MedStar Institutional Review Board.

To assess the success of the new point system, residents were surveyed anonymously regarding the new system and how it compared with the previous one. The survey instrument is provided as online supplemental material. Postgraduate year (PGY)-1 residents were not included in the comparative analysis as this was their first scheduling experience. The survey instrument, designed with input from faculty with teaching expertise, was not tested for validity. A Wilcoxon signed rank test comparison was utilized to determine whether there was a preference for either system. Finally, anonymous comments were solicited from residents, chief residents, and the program director.

Results

The resident satisfaction survey was completed by 30 of 32 residents (94%). Chief residents were excluded

because of their involvement in creating and implementing the new system. Twenty-one of 27 residents (78%) felt more involved in the scheduling process, and 24 of 31 residents (77%) said they would recommend this system to other programs. Satisfaction scores comparing the new and old scheduling systems were collected from PGY-3 and PGY-2 residents (18 total) and were 6.94 and 6.06 on a scale of 1 to 10, respectively. A Wilcoxon signed rank test comparison was applied to these data, which showed no statistical difference ($W = 27.0$, $P = .20$). The overall satisfaction score with the point-based system from residents of all levels of training, excluding chief residents, was 7.6 on a scale of 1 to 10 ($n = 27$).

Discussion

Residents were pleased with the new approach. However, compared with the traditional scheduling model, there was no statistical difference in satisfaction scores.

A possible reason is that some residents did not appear to fully understand the new system, as some still had points remaining at the end of the bidding process, and there is no value in residual points. All residents, however, seemed to understand the system after the final schedule was revealed and implemented.

Comments from stakeholders were insightful. For this system to work well, there needs to be full cooperation from residents and strong support from program leadership. Residents appreciated the new ability to quantify the strength of a request in the new system as well as its aim for transparency, fairness and neutrality, shared governance, and personal empowerment. Although we did not formally measure their time spent scheduling, chief residents reported that they spent significantly less time with the new system, largely because they spent less time arranging trades among residents. Although they reported spending added time teaching residents about the new system, they anticipate that this time spent will decrease as residents become familiar with the new approach. Chief residents reported more satisfaction and less stress.

Programs are challenged to create resident schedules that meet clinical service needs as well as Accreditation Council for Graduate Medical Education duty hour requirements. Traditional scheduling methodologies prioritize regulatory and institutional needs and do not directly acknowledge the personal needs of residents. Although residents do not all receive their ideal schedules under the point system model, they have some added control over the

scheduling process and are able to express scheduling preferences that can help balance their work-life demands.

Programs can tailor a point-based scheduling system to the needs of their specific circumstances. The system can be implemented for the annual schedule, the monthly call schedule, or both. Furthermore, programs can use additional points to reward and incentivize residents for performing tasks, such as completing medical records or attending conferences.

To our knowledge, this is the first study to compare scheduling systems in graduate medical education and to advocate for a value or point-based system. Other investigators have utilized operations research methodologies for resident scheduling based on the traditional scheduling model, relying on computer technology to perform tasks that chief residents have heretofore completed by hand.^{3,6}

Limitations of this study include that it was conducted in 1 academic year at a single site with a single specialty, thus reducing generalizability. The survey instrument used in assessing resident satisfaction lacked validity evidence, and respondents may have interpreted the questions differently than intended.

Further testing of this model, including sustained testing and application in larger programs, is needed to assess the model's utility and long-term sustainability.

Conclusion

We implemented a new point-based scheduling system that allowed residents to objectively express preferences for their scheduling. Based on our early experience, the new approach provides programs with an opportunity to acknowledge the personal preferences of trainees without compromising the integrity of the academic experience.

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