



Effect of Nonvisit Care on Resident Workload in a Family Medicine Residency

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BACKGROUND AND OBJECTIVES: Primary care physicians can spend 24% of their ambulatory care work day on patient care duties outside the office visit (ie, nonvisit care [NVC]). Resident work hours must be performed within duty hour restrictions defined by the Accreditation Council for Graduate Medical Education, making it crucial for program directors to understand how much time residents spend on NVC tasks. Little information is available on resident work hours dedicated to NVC generated in the continuity clinic. We designed this study to look at an objective measure of the time family medicine residents spend on NVC.

METHODS: We collected and categorized from the electronic health record the NVC events completed by 22 family medicine residents in a rural residency training clinic over a 9-month period. With the use of an institutional time study performed in 2014, we identified the average amount of time required to complete a single event in each category of NVC.

RESULTS: Residents spent a mean of 13.6 hours per month completing NVC, which was equivalent to 127.3 minutes of NVC per 100 empaneled patients per month for each resident.

CONCLUSIONS: This study quantified the amount of time residents spend on NVC, allowing program directors to plan curriculum so that residents can keep their work time within duty hour requirements.

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Primary care work can be classified into two major categories: work associated with an office visit, and work not associated with an office visit (nonvisit care [NVC]). NVC consists of activities such as reviewing test results, communicating with patients, refilling prescriptions, completing forms, and coordinating care. Family physicians may spend up to 24% of their workday on NVC.¹⁻⁵ Farber et al⁶ reported that internists in an outpatient

academic geriatric practice spent 112.2 minutes per week on NVC activities.

The workload of resident physicians is required to be performed within duty hour restrictions defined by the Accreditation Council for Graduate Medical Education (ACGME).⁷ Internal medicine residents have been reported to spend 12% to 20% of their hospital time on direct patient care,^{8,9} and 34 minutes per patient per day completing indirect

patient care tasks.⁸ Gilleland et al¹⁰ reported that internal medicine residents on outpatient rotations spent 1.2 hours per week after hours on the electronic health record (EHR).

The majority of training programs use resident self-reports to track work hours, which has been shown to lead to overestimations of time worked.¹⁰ The time spent on NVC may affect duty hours, so it is important to have a reasonable idea of how much time residents spend on NVC. Family medicine residents spend nearly the same amount of time on the EHR as face-to-face patient time when including all EHR activities, including documentation and billing.¹¹

Little information is available on resident work hours dedicated to NVC for work generated in the continuity clinic. In particular, we are not aware of any data estimating the time that FM residents spend on NVC. We designed this study to look at an objective measure of the time FM residents spend on NVC.

Methods

We performed this study in a rural FM residency training clinic affiliated with an academic medical institution in Southeastern Minnesota. The study cohort of 22 residents ranged from postgraduate year (PGY) 1 to 3.

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FM residents were involved in this study from September 2015 through May 2016. We excluded the months of June (when PGY-3 residents were graduating) and July and August (when PGY-1 residents were still in orientation). The residents were responsible for the asynchronous care of their continuity patients through the EHR, regardless of their current rotation. Due to duty hour restrictions, most residents were probably working on NVC during either hospital or clinic shifts.

The types of NVC were recorded and sorted automatically by the EHR according to the message content or message origination into 26 categories. Administrative reports were available by work units down to the provider level. NVC events were not time stamped, and thus it was not possible to determine whether the resident completed the work during or after assigned work hours. Our institution previously performed a time study in 2014 (unpublished data) and the average time spent completing one NVC event in each category was then calculated.

We obtained patient panel size for each resident from our clinic's HER, and we performed statistical analysis with MedCalc software, version 17. The Mayo Clinic Institutional Review Board approved this study.

Results

Of the 22 residents in the study cohort, nine were PGY-1 residents, six were PGY-2 residents, and seven were PGY-3 residents. Mean panel sizes were 598 patients (95% CI, 545-650 patients) for PGY-1 residents, 679 patients (95% CI, 655-702 patients) for PGY-2 residents, and 668 patients (95% CI, 652-683 patients) for PGY-3 residents.

We documented a total of 52,612 NVC events during the study period and organized them into 26 categories. Table 1 lists the six most common NVC categories. The mean number of events per resident for the 9 months was 2,391 (95% CI, 1,938-2,844; range 1,187-5,010; Table 2). Each resident had a mean of 41.4

Table 1: The Six Most Common Categories of NVC Activities Performed by Residents

| Category | NVC Events, No. | Time per Event ^a |
|--|-----------------|-----------------------------|
| Orders to sign | 15,824 | 1:00 ^b |
| Care review (test results) | 12,950 | 2:59 |
| General message (patient portal) | 6,173 | 8:44 |
| Miscellaneous | 3,231 | 3:40 |
| Emergency department visit (alert sent to PCP) | 2,334 | 1:39 |
| Telephone message (patient generated) | 1,474 | 7:00 |

Abbreviations: NVC, nonvisit care; PCP, primary care provider.

^a As measured in the 2014 time study; presented here as minutes:seconds

^b Estimated time

Table 2: Number of NVC Events and Time Spent on NVC

| PGY | No. of NVC Events per Resident, Mean ^a | Time Spent on NVC per Month, Mean | |
|-------------------|---|-----------------------------------|--------------------------|
| | | Hours | Minutes per 100 Patients |
| 1 | 1,521 | 8.7 | 90.2 |
| 2 | 3,964 | 22.6 | 181 |
| 3 | 2,387 | 14.5 | 131 |
| All PGYs combined | 2,391 | 13.6 | 127.3 |

Abbreviations: NVC, nonvisit care; PGY, postgraduate year.

^a During 9 months of present study.

NVC events per 100 empaneled patients per month.

The mean number of NVC events over the 9 months was highest for PGY-2 residents (3,964; 95% CI, 3,197-4,732). For PGY-3 residents, the mean number of NVC events was 2,387 (95% CI, 2,084-2,691); for PGY-1 residents, 1,521 (95% CI, 1,369-1,673; Table 2).

Utilizing the institution's previous time study, the average FM resident would be predicted to spend a mean of 818 minutes per month on NVC duties. For our typical resident with a patient panel size of 642, this correlated with an expected 13.6 hours per month of NVC time or 127.3 minutes per 100 empaneled patients per month.

Discussion

Our goal was to define how much time residents spend on NVC with continuity practices. We found that family medicine residents can expect to spend 127.3 minutes per 100 empaneled patients per month on NVC. With a mean panel size of 642 patients, our residents spent an average of 13.6 hours per month on NVC. The monthly average of 13.6 hours in our study is considerably larger than the previously reported 1.2 hours per week of after-hours care spent by internal medicine residents.¹⁰ But our family medicine residency may be unique. The individual physician panel size is consistent for all 3 years and the actual days in clinic is remarkably consistent for all 3 years. However, the second year is

much more hospital- and call-heavy, which may be why our residents use NVC more the second year.

Through NVC activity, residents may learn about managing acute and chronic diseases in an ambulatory setting, strengthen preventive health and screening knowledge, improve communication skills, develop team skills, and strengthen doctor-patient relationships. NVC care that does not require thoughtful judgment, such as signing forms and refilling routine prescriptions, may be less valuable.

The strengths of this study include the extended period involved and the large numbers of NVC events. Our study design allowed us to evaluate time spent doing all NVC duties, whether done outside assigned work hours or during other rotations.

Limitations of this study include the fact that the estimated time for each category of NVC comes from a direct measurement of board-certified physicians performing these tasks. Residents may take longer to perform similar duties, and this could have led to an underestimation of the time residents spent on NVC. Our study did not control for the number of face-to-face visits, patient age, or medical complexity of the patient panel. Our residency is a rural program and the experiences encountered by our residents may

not be seen by residents in an urban or nonacademic settings. Since our program has recently seen a change in our EHR, a repeat study would be of interest, especially with programs with a similar EHR. Our residency program routed prescription refills for unlicensed residents to the faculty along with refill requests, patient triage, and other tasks deemed urgent by the patient or allied health staff. Since these NVC tasks did not show up under the resident, it could lead to underestimation of the NVC time required for managing the patient panel.

Our data shows the time burden from NVC required in a resident continuity practice. Residency programs should also strive to develop curricula that maximize resident efficiency in completing NVC tasks and be aware of the time burden of these tasks. Curricula can also communicate to residents the value of caring for their patients via NVC.

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