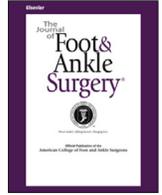




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Original Research

A Formal Work Hour Analysis of the Resident Foot and Ankle Surgeon

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ABSTRACT

As new documentation requirements by governments and third-party payees increasingly occupy physicians' time, duty hour restrictions have continued to restrict the work hours of residents, leaving programs tasked to produce proficient foot and ankle surgeons (FASs) in less time. The purpose of the present study was to quantify the workday of resident FASs at our institution to identify areas suited for revision to improve efficiency and training. A resident from each postgraduate year (PGY) was recruited and consented for minute-to-minute observation by 4 independent observers over 5 consecutive workdays. The time recorded was placed into a predefined work model consisting of 9 categories (education, research, operating room, patient care, documentation/administration, communications, transit, basic needs, and standby) within 1 of 3 value groups (positive, neutral, or negative). A fifth independent observer reviewed and recorded all collected data. Over 5 consecutive days, ancillary staff frequently disrupted the PGY-1 resident's workflow. The interruptions fragmented the resident's thoughts, increased inefficiency, and resulted in the largest proportion of the resident's time (16.7%) being occupied by documentation/administration duties. For the PGY-2 and PGY-3 residents, unexpected trends in standby were identified during the preoperative period. Secondary analysis revealed that during unexpected preoperative delays, resident efficiency was poor. To maximize efficiency and improve training, residents must increase their awareness of self-inefficiency while minimizing unnecessary interruptions and the time occupied by duties of lesser value. It is our hope that the present study will aid other institutions in facilitating similar improvements to the education and training of our fellow resident FASs.

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Residency training in the United States for foot and ankle surgeons (FASs) holding the degree of Doctor of Podiatric Medicine (DPM) is a balance between formal didactics, operating experience, and clinical care. Fatigue and sleep deprivation are common during the years of graduated experience, and intuitively, contribute in part to preventable medical errors. In July 2003, initial concerns over resident fatigue and patient safety prompted the Accreditation Council for Graduate Medical Education (ACGME) to limit resident work hours to 80 per week (1). A

2008 report by the Institute of Medicine called for further work hour restrictions, and additional restrictions were implemented in July 2011 (2,3). Core elements established included an 80-hour per week/16-hour per day maximum, 24 hours free from clinical experience/education every seventh day, and in-house on call no more frequent than every third night. Despite the purported benefits of the restrictions, a report in the *New England Journal of Medicine* the following year highlighted concerns among residents regarding their education and patient care (4). Nonetheless, without definitive evidence regarding the long-term effects of the duty hour on graduate medical education, some organizations continued to call for further restrictions, attempting to align the United States with other countries in which residents work between 37 and 70 hours per week (5,6).

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In July 2017, the ACGME implemented further work hour restrictions in the Common Program Requirements Section VI (7). The new policy mandates that clinical work performed at home must now be counted toward the 80-hour per week maximum, and residents must not exceed 24 hours of continuous scheduled clinical assignments without at least 14 hours free of clinical work. To address concerns regarding patient safety from frequent “handoffs” and minimize the “shift-worker mentality,” residents may now voluntarily remain at work following the conclusion of their scheduled duty hours only in circumstances where they deem it necessary for their education or patient safety. As with previous revisions, the ACGME continues to strengthen its position on resident well being, specifically aiming to ensure that residents are not “overburdened with clerical work and/or other nonphysician duties” and that they “prioritize sleep over other discretionary activities” (8).

To date, there has only been speculation and conjecture regarding the effects of the imposed restrictions on the training of resident FASs. In the face of decreasing duty hours, programs are now tasked to produce proficient FASs in less time. To meet this challenge, programs must ensure that their residents engage their duties with increased efficiency while simultaneously minimizing the time occupied by duties of lesser value. Prior to conducting the present study, preliminary changes were implemented at our institution (Westside Regional Medical Center, Plantation, FL) in an effort to ensure that incoming interns retained as many educational opportunities as possible and were not burdened unnecessarily by dysfunctional/inefficient processes or duties handed down from previous resident years. These changes included eliminating phone dictations for new inpatient consultations, the implementation of an alternative protocol for logging operative cases, the creation of a live surgery schedule available 24 hours a day/7 days a week, restructured formal didactics and clinical responsibilities, clearly outlined research goals, and the insistence that paid time be used in full (14 days per calendar year).

Despite the purported benefits during the initial 90 days after implementation of the changes, we sought to further analyze the workday of resident FASs at our institution. Although previous investigations have discussed various aspects of resident FASs’ education and training, no formal work hour analysis had been conducted until now (9–15). The purpose of the present prospective observational study was to quantify the workday of resident FASs at our institution to become more cognizant of the proportion of time occupied by various duties among each postgraduate year (PGY) (1–3). Furthermore, we sought to identify processes and duties suitable for revisions aimed at further increasing resident efficiency and the time for value-positive opportunities.

Materials and Methods

Resident FASs at surrounding tertiary medical centers were polled and responded to a survey conducted to assess the generalizability of the results. For the assessment, all programs throughout the state of Florida, excluding our institution, were initially screened ($n = 19$) by a resident FAS (C.J.R.) via the programs websites, and the Centralized Application Service for Podiatric Residencies/Centralized Residency Interview Process directory summaries. Programs with a direct affiliation to a podiatric medical school (Barry University School of Podiatric Medicine and Surgery), <2 residents per PGY, <15 to 20 operative cases per week or <2000 operative procedures/<1000 cases logged per resident at graduation, and those not responsible for trauma call below the tibial tuberosity were excluded ($n = 10$). From the remaining programs ($n = 9$), 4 were selected using a random sequence generator to represent other high-volume, surgically based programs throughout the state of Florida. Surveys were subsequently distributed to inquire about the duty hours (daily, weekly), rounding responsibilities, operative volume, and trauma call; these surveys were completed by 3 of the 4 programs, for a response rate of 75%. Analysis of the survey responses showed that our program closely approximates the time constraints placed on other resident FASs at other high-volume, surgically based programs in Florida responsible for trauma call below the tibial tuberosity.

Under Institutional Review Board exemption, this prospective observational study was conducted from December 4 to 8, 2017, at our podiatric medicine and surgery residency with the added credential of reconstructive rearfoot/ankle surgery (PMSR/RRA) located in Plantation, Florida. Coverage responsibilities during the temporal period included 24-hour trauma call below the tibial tuberosity at 2 tertiary care centers, operative coverage at 6 locations, and at least 1 half-day of clinical encounters in an attending

FAS’s office. The month of December was intentionally selected for this study, because it is near the midpoint of each resident’s respective PGY, at which point theoretically less time should be wasted on duties because of inexperience. A resident FAS from each PGY (1–3) was recruited at random and consented for minute-to-minute observation by 4 independent observers (A.B.P., V.L.M., S.A.S., and S.F.B.) during 5 consecutive workdays. No institutional affiliations were present for any of the observers during the observation period, and all observers were pretrained in the shadowing of the resident FASs (7 am to 5 pm) before study initiation to prevent workflow disruption and minimize the Hawthorne effect during data collection. A fifth independent observer (D.C.R.) was recruited to review and record all data collected at the end of each workday. None of the recruited resident FASs had participated in either the Institutional Review Board or the screening and polling of programs, and all were blinded as to the purpose of the investigation. Furthermore, the recruited residents were encouraged to perform their daily work duties as if they were not under observation.

The time recorded (minute-to-minute) was placed into a predefined work model consisting of 9 categories falling within 1 of 3 “value” groups (positive, neutral, or negative), modified from a previous investigation (6). Duties with clear “positive” educational value included education, research, operating room, and patient care (new/existing). Duties with “neutral” educational value offered both positive/negative value or were necessary for daily workflow. These duties included documentation/administration, communications, transit, and basic needs. Finally, duties with no clear educational value were deemed value-“negative” and included in the category of standby. Education (ED) was defined as time spent on formal structured didactics occurring twice per week (Monday and Wednesday) and time spent reading journal articles, lecturing medical externs, reviewing surgical preparation resources, or preparing for/taking board examinations. Research (R) was defined as any time spent on self-directed research, preparation for abstract (manuscript/poster) presentation, or journal publication. Operating room (OR) was defined as time spent in the operating room performing/assisting in surgery, or reviewing diagnostic imaging, surgical principles/procedural selection, and complications with an upper resident/attending FAS in the perioperative period at either tertiary care centers or outpatient surgical centers. Patient care (PC) was defined as nonoperative time directly spent with new or existing patients in either the hospital or outpatient clinical setting. Documentation/administration was defined as time spent recording patient history/physical examinations, reviewing documentation from other providers, note writing, updating the patient census, recording/confirming the surgical schedule for the following day, logging surgical procedures, prescription writing, or recording physician entry orders. Communications was defined as time spent on any form of communication with other physicians, nurses, or ancillary staff not occurring directly during education, the operating room, or patient care. Transit was defined as time spent walking throughout the hospital, and other associated facilities, as well as driving time to and from those facilities. Basic needs were defined as time spent eating, drinking, grooming, using the restroom, or physician wellness activities (e.g., walking, aerobic activities). Standby was defined as the time spent on activities not included by the foregoing 8 categories.

We considered standby time “wasted” time, spent waiting for patients to be brought back to the operating room (preoperative period), test results, communication/plans of care from attending physicians/ancillary staff, gathering supplies for in-house patients, preparations for conscious sedation for fracture-dislocation reduction in the emergency room department, or any other unexpected workday delays. For work-related duties performed offsite (e.g., home)/outside of the formal scheduled duty hours (7 am to 5 pm), a resident log was kept and transmitted to the observers for appropriate allocation into 1 of the 9 predefined categories. This protocol was also followed for any instances when an observer was not permitted to accompany the resident FAS during the formal scheduled duty hours (owing to patient or attending request).

Statistical Analysis

The times collected by the 4 independent observers were reviewed at the end of each workday by the fifth independent observer (D.C.R.) and a resident FAS (C.J.R.) before being recorded. Descriptive data were calculated by averaging the times and number of performed duties collected by the independent observers for each predefined category in the work model over the observation period. These averages (times and number of duties) were confirmed at the end of the observation period by attending FASs (M.R., S.M.S.), neither of whom was under observation during the investigation. Generalized linear models using a gamma or negative binomial distribution were used to determine statistical significance between the predefined work model categories and the postgraduate resident year. All analyses were conducted using version 3.4.2 software (SAS Institute, Cary, NC).

Results

Over the course of 5 consecutive days, the resident FASs worked a median of 709 minutes per day (IQR, 602 to 787) for the PGY-1 resident, 600 minutes per day (IQR, 555 to 651) for the PGY-2 resident, and 609 minutes per day (IQR, 600 to 695) for the PGY-3 resident. No significant differences were identified among the 3 resident FASs regarding the median hours worked per day ($p = .296$). The distribution of value categories (positive/neutral/negative) also varied among the residents,

but in general, the largest proportions of time were occupied by value-positive duties, and no significant differences were identified among the groups ($p = .116$) (Fig. 1). Conversely, the number of duties performed per day differed significantly by PGY, with a median of 28 duties (IQR, 23 to 32) for the PGY-1 resident, 20 duties (IQR, 17 to 21) for the PGY-2 resident, and 14 duties (IQR, 11 to 14) for the PGY-3 resident ($p = .044$). Moreover, the median time spent on a single duty before an interruption/transition to a subsequent duty also differed significantly by PGY, at 25.3 minutes (IQR, 18.7 to 26.1) for the PGY-1 resident, 32.5 minutes (IQR, 30.5 to 35.2) for the PGY-2 resident, and 49.6 minutes (IQR, 44.6 to 54.5) for the PGY-3 resident ($p < .001$). Secondary analysis revealed frequent transitions between documentation/administration duties and communications for the PGY-1 resident, but not for either of the upper PGY residents.

Positive Educational Value: Education, Research, Operating Room, Patient Care

Over the course of the observation period, approximately 42.12% (1500 minutes) of the PGY-1 resident's time was spent on value-positive duties. Specifically, ED accounted for 10.95% (390 minutes); R, 3.7% (132 minutes); OR, 15.81% (563 minutes); and PC, 11.65% (415 minutes) of the resident's time (Fig. 2). This varied from the overall proportion of time spent on the same duties by the PGY-2 resident (41.86%; 1250 minutes), as well as the proportion of time spent by the PGY-2 resident on any particular duty within the category: ED, 7.27% (217 minutes); R, 2% (60 minutes); OR, 20.53% (613 minutes); PC, 12.06% (360 minutes) (Fig. 3). Differences were also identified with respect to the PGY-3 resident, who spent 54.43% (1873 minutes) of the observation time on value-positive duties. The majority of the senior resident's time was occupied with either the operating room (24.18%; 832 minutes) or patient care (21.83%; 751 minutes), with no time spent on formal research (Fig. 4). The times occupied in value-positive duties among the PGY residents are displayed in Figs. 1–5.

Neutral Value: Documentation/Administration, Communications, Transit, Basic Needs

For the PGY-1 resident, the proportion of time occupied by duties deemed neutral was 44.9% (1597 minutes). Specifically, documentation/administrative duties accounted for 16.7% (595 minutes); communications,

Graph 1: PGY1

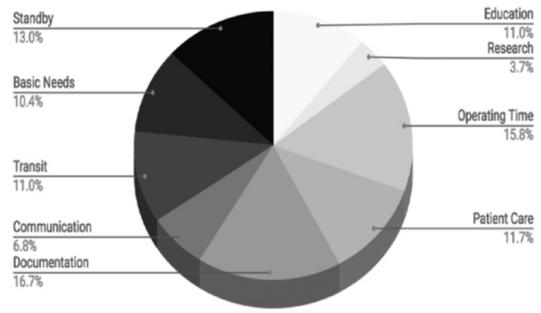


Fig. 2. Postgraduate year-1 resident's time occupied by duties over the observation period.

Graph 2: PGY2

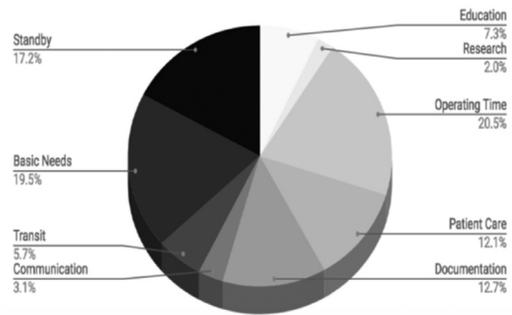


Fig. 3. Postgraduate year-2 resident's time occupied by duties over the observation period.

6.76% (241 minutes); transit, 11% (392 minutes); and basic needs, 10.36% (369 minutes) of the resident's time (Fig. 2). In comparison, these duties

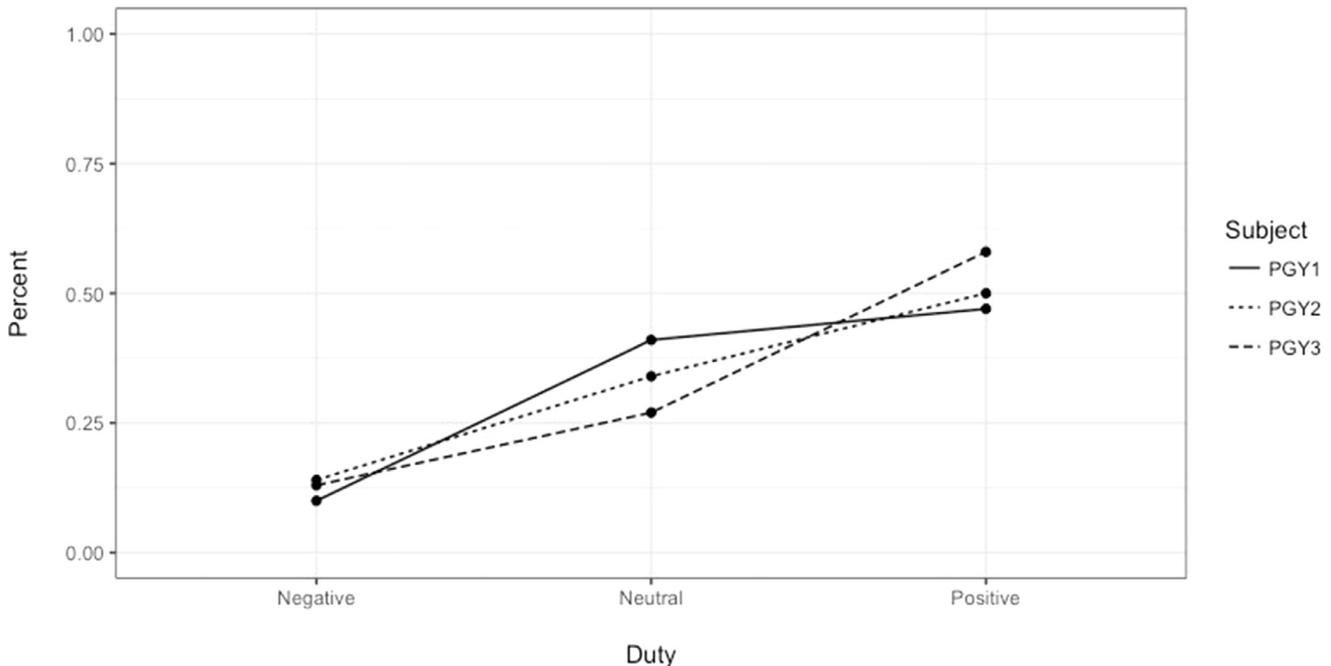


Fig. 1. Percentage of time occupied overall by value positive/neutral/negative duties.

Graph 3: PGY3

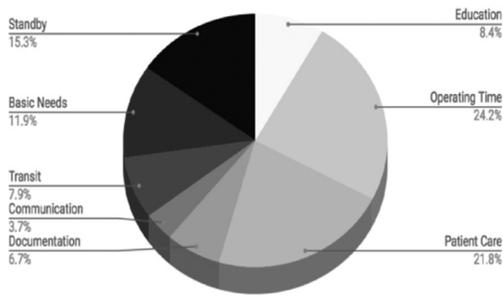


Fig. 4. Postgraduate year-3 resident's time occupied by duties over the observation period.

accounted for 12.7% (379 minutes), 3.8% (92 minutes), 5.7% (170 minutes), and 19.46% (581 minutes), respectively, of the PGY-2 resident's time (overall, 40.9%, 1222 minutes) and 6.74% (232 minutes), 3.69% (127 minutes), 7.93% (273 minutes), and 11.92% (410 minutes), respectively, of the PGY-3 resident's time (overall, 30.3%; 1032 minutes) (Figs. 3 and 4). The proportion of time occupied by value-neutral duties overall was relatively consistent among the 3 residents (44.9%, 41.0%, and 23.54%), although less time was spent on documentation/administration and communications with each successive PGY (Fig. 1). In comparison, the PGY-1 resident spent more time on documentation/administration, communications, and transit while experiencing more frequent interruptions during documentation/administration duties than either of the other residents under observation. Conversely, the PGY-2 resident spent the most amount of time on basic needs (19.46%; 581 minutes) (Fig. 5).

Negative Educational Value: Standby

The proportion of time occupied by duties deemed value negative were highest for the PGY-2 (17.2%; 514 minutes), and PGY-3 (15.3%; 526 minutes) residents and lowest for the PGY-1 resident (13%; 464 minutes) (Figs. 1–5). The wasted time was particularly prevalent in the preoperative period. Secondary analysis revealed no transitions to value-positive duties from either of the upper-level residents during the observed preoperative standby periods.

Discussion

Since the initial implementation of the ACGME's duty hour restrictions, multiple revisions have continued to restrict the work hours of residents in an effort to reduce the incidence of preventable medical errors and improve resident education. The apprenticeship model of training has remained largely unchanged, however, despite a precipitous increase in the number and sheer complexity of operative techniques now taught. Previous work hour analysis from other surgical specialties have highlighted decreasing operative volumes for lower PGY residents, decreasing operative opportunities for junior residents to assist their senior residents, and an increase in resident publications (16–20). To become more cognizant of the revised workflow of resident FASs at our institution under the most recent ACGME restrictions (July 2017), we used a modified predefined work model and sought to identify processes and duties suited for revision to further increase resident efficiency and the time for value-positive opportunities.

During the formal work hour analysis, the 3 resident FASs worked a median of 709 minutes per day (IQR, 602 to 787) for the PGY-1, 600 minutes per day (IQR, 555 to 651) for the PGY-2 resident, and 609 minutes per day (IQR, 600 to 695) for the PGY-3 resident. The proportion of time occupied by duties falling into 1 of the 3 value groups (positive/neutral/negative) varied among the residents, but in general, the PGY-3 resident spent the most time on value-positive duties (54.43%) (Fig. 1). Specifically, 24.18% (832 minutes) of the PGY-3 resident's time over 5 consecutive days was occupied by the operating room and 21.83% (751 minutes) was occupied by patient care, the resident's two most commonly performed duties (Fig. 4). These findings were not entirely unexpected, because it is typical for senior residents of any surgical specialty to apportion less-valuable duties to lower PGY residents. Consistent with this, the proportions of the PGY-1 resident's time occupied by documentation/administrative duties (16.7%), transit (11%), and communications (~6%) significantly exceeded that of the other residents, and overall, documentation/administration (16.7%) occupied the most substantial proportion of the intern's time (Fig. 5). Compared with the other 2 residents, the PGY-1 resident also experienced more frequent workflow interruptions, the majority of which resulted from communications (ancillary staff) during documentation/administration duties. Although PGY-1 residents are expected to perform more documentation/administrative duties at our

Graph 4: Comparison by Resident Year and Task

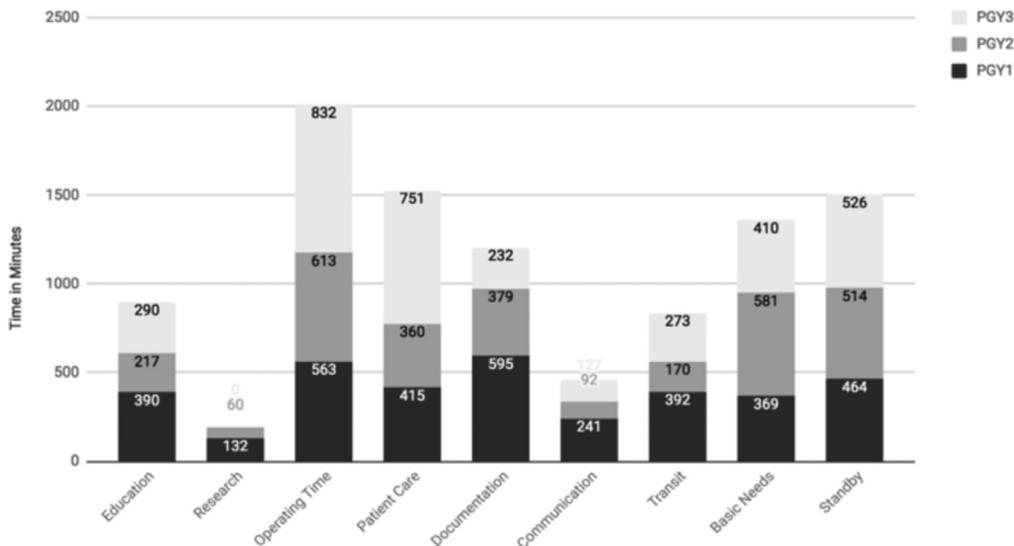


Fig. 5. Overall time occupied by duties (minute total) in the 3 residents over the observation period (5 consecutive days).

institution, the frequent interruptions fragmented the resident's thoughts, increased inefficiency, and resulted in a more substantial proportion of the resident's time being occupied by the value neutral duty (Figs. 1 and 2).

Unexpectedly, standby was significantly greater for the PGY-2 (17.21%) and PGY-3 (15.23%) residents compared with the PGY-1 resident (13.03%). This resulted in similar proportions of time recorded for value-neutral/negative duties among the residents despite disproportionately more documentation/administrative duties, communications, and transit recorded for the PGY-1 resident during the observation period. Secondary analysis of the PGY2/3 residents duty hour logs revealed that the majority of standby time ("wasted time") occurred in the preoperative period and resulted from unexpected preoperative delays. Although these unexpected delays are generally outside of the resident's control (e.g., staff, anesthesia, patient, attending FAS) the lack of recorded transitions to value-positive/neutral duties during standby, differences in the median number of daily duties performed (PGY-1, 28; PGY-2, 20; PGY-3, 14) and the proportion of time occupied by "basic needs" (PGY1, 10.36%; PGY-2, 19.46%; PGY-3, 11.92%) suggest little if any proactive effort was made by either upper resident to efficiently use their time during the preoperative delays ($p = .044$). Furthermore, despite being apportioned lower-value duties, working longer hours, and experiencing more frequent interruptions, the PGY-1 resident spent a higher proportion of time on formal research compared to both the other residents combined (Figs. 2–5).

To the best of our knowledge, the present study represents the first attempt to quantify the workflow of resident FASs in the United States. We sought to become more cognizant of the proportion of time occupied by duties of value while identifying processes and duties suited for revision to further maximize resident efficiency, and training at our institution. Based on our results, it is clear that minimizing the dysfunctional, repetitive interruptions from hospital/office staff will improve the workflow and efficiency of the PGY-1 residents. Institutional cell phones provided to each resident have since replaced "on-call pagers", and communication with the nursing supervisors and office managers has eliminated any unnecessary notification protocols and established dedicated block times for all routine communications, and queries. However, unexpectedly, the most significant improvements to be made also represent the easiest to accomplish: awareness of self-inefficiency and proactive initiative. During the present study, the operative interventions performed ranged from 1 to 9 cases per day, with an average of 6. Assuming a minor delay of 15 to 20 minutes per case, a PGY-2/3 resident designated as the primary assist in multiple cases could easily accumulate 1 to 2 hours of standby time in a single day. While seemingly innocuous, the cumulative effect potentially represents an inordinate amount of unnecessarily lost training time over the course of the resident's final 2 years (>2 months). Although proactive residents may easily direct this time independently toward the pursuit of scholarship, residents' motivations and learning rate can vary widely, even among residents training at the same institution. Owing to this, and to the research disparity identified during the observation period, quarterly efficiency evaluations, a research month with institutional support and formal mentorship, and a non-profit organization (Foot and Ankle Research Foundation of South Florida Inc.) were established in July 2018 to better guide and encourage the pursuit of scholarship among resident FASs at our institution.

Among the programs currently training residents in the United States, some have well-established known reputations for exorbitant work hours (>80 hours per week), in direct violation of the ACGME's duty hour restrictions. Certainly, to some degree, practice portends perfection, and undoubtedly reduced work hours could translate into less-experienced generations of future FASs. This inexperience is not likely to be solely operative, with potential consequences for how future FASs acquire/incorporate new knowledge through the pursuit of scholarship, understand the changing healthcare landscape, and manage their

practice. However, regardless of how well intentioned, exorbitant work hours jeopardize accreditation and patient safety while establishing and encouraging suboptimal behaviors and habits (e.g., overwork, overwhelming stress, neglect of personal health) that predispose for burnout. Physician burnout is a long-term stress reaction marked by emotional exhaustion, depersonalization, and a lack of personal accomplishment. Among medical professionals, the incidence has continued to rise in recent years, and it is now estimated to affect up to 87% of physicians and 51% of surgical residents (21,22). Although the incidence and prevalence of burnout among FASs has yet to be determined, a growing body of medical literature has continued to link its devastating effects (e.g., psychological, professional, financial, social) to an increasingly alarming suicide rate, especially among female surgeons (21–23). Given that increasing efficiency and reducing the proportion of time occupied by duties of lesser value can provide ample time for simulation laboratories (e.g., cadavers, sawbones) and other comprehensive evaluation tools to further enhance the resident's skill acquisition and learning, no foreseeable advantage exists for exorbitant work hours. As such, we recommend attending FASs entrusted to impart precept and oral instruction to indentured residents at these institutions reevaluate whether continuing to do so is consonant with their residents' best interests.

Our study has several limitations inherent to its design. First, the investigation was conducted at a single institution, which could affect the generalizability of the results. Although the survey conducted demonstrated good generalizability to other high-volume surgically based programs in Florida, we acknowledge the inherent variability (work hours/flow/surgical volume) among institutions training resident FASs. Owing to the purpose of this investigation, however, the use of a predefined work model and single-site analysis were ideal. Second, only a single resident from each respective PGY "on-service" was recruited at random and consented for observation. Certainly, the individual motivation and work ethic may vary among residents at the institution, even among residents of the same PGY. However, although the duty hours of other residents may have differed, each PGY at our institution has separate, clearly defined responsibilities/requirements that dictate their daily workflow. Therefore, observation of any on-service resident from a respective PGY would accurately depict the daily workflow consisting of these core responsibilities/requirements. With consideration to the fact that 5 manuscript submissions were completed just before the observational period (September to November), it was not entirely surprising that so little time was spent on formal research. Thus, the time occupied by formal research in the present study is an underestimate. Third, the work hours varied among the PGY residents. Although standard duty hours at our institution are 7 am to 5 pm, it is common for PGY residents from any given year to begin/continue work before and after their scheduled duty hours either at the hospital or offsite. In compliance with the ACGME revisions implemented in July 2017, these additional duty hours (outside of those scheduled) must now be counted toward the formal duty hour maximum. Because it was not feasible to ask the independent observers to continue observation of the residents offsite (home), any work-related duties performed from home (e.g., notes, reading for surgery) were recorded by the resident and transmitted to the corresponding observer for allocation into the appropriate predefined category. A similar protocol was followed when an observer was not permitted to accompany the resident FASs during any of their formal duty hours (patient or attending FAS request). Although previous studies have had standardized duty hours during observation, doing so would have failed to accurately depict the workday at our institution and skewed the results. Nonetheless, we acknowledge that some of the duties performed may have been lost "in translation" during this process and not recorded. Finally, considering the initial dialogue that led to the preliminary revisions at our institution (July 2017) before initiating the formal work hour analysis, it is

plausible that the residents under observation may have deduced to some extent the purpose of the study. Still, all residents under observation were encouraged to conduct their duties as if they were not being observed, and an attempt was made to minimize the Hawthorne effect by pretraining the independent observers. Despite these limitations, we believe this prospective observational study highlights the importance of developing and increasing awareness regarding the training model of FASs in the United States. It is our hope that the protocol and model presented here may assist other institutions in proactively identifying and initiating improvements to the training of our fellow resident FASs.

In conclusion, the scope and emphasis of training for resident FASs in the United States entails a graduated responsibility, diametrically different decades prior. While presumably reduced duty hours could result in reduced opportunities of value (Education, Research, Operating room, and Patient care), reducing the proportion of residents' time occupied by duties of lesser value and increasing residents' awareness of self-inefficiency can mitigate this risk. Based on the present study, we find no evidence to support or warrant exceeding the imposed ACGME duty hour restrictions for resident FAS training in the United States, even at high-volume, surgically based PMSR-RRA programs responsible for trauma. Although historically residents at programs exceeding 80 hours per week have been characteristically tolerant and disposed to appease, it is prudent all residents take personal responsibility, and accountability for their institutions' training and be proactive in facilitating improvements. Saliiently, it is our hope that the present study will aid other institutions in facilitating similar improvements to the education and training of our fellow resident FASs.

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