

Medical Student Perceptions of 24-Hour Call



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OBJECTIVE: To assess the medical student perception and experience of a 24-hour call requirement, and to learn if improvements can be made to improve the 24-hour call requirement.

DESIGN: Medical students completing their required surgical clerkship over 1 academic year at our institution were surveyed prior to their clerkship and on the last week of clerkship regarding their perceptions and experience with 24-hour call.

SETTING: This study was performed at the University of Minnesota, in Minneapolis, Minnesota, a medical school and tertiary medical center.

PARTICIPANTS: Two hundred one medical students were given the option to complete an anonymous survey before and after their required surgical clerkship.

RESULTS: Response rate for the preclerkship survey was 70% (n = 140) and 58% (n = 117) for the postclerkship survey. The mean age of respondents was 26 years, and the majority of students were in their third year of medical school. After completing the clerkship, students interested in surgery more often agreed the 24-hour call requirement should remain (51% versus 31%, p = 0.01). Students rotating at a Level I Trauma Center were also more likely to agree the call requirement should remain (59% versus 33%, p = 0.008). Medical students generally had less concerns (mental health, fatigue, mistakes, and grade performance) related to 24-hour call after completion of the clerkship. Concerns about the effect of 24-hour call on study schedule remained high in both pre and postclerkship groups.

CONCLUSIONS: Medical students have concerns about the experience prior to the clerkship that diminished by

its completion. To improve medical student perceptions and overall experience of 24-hour call, frequency of shifts could be limited and the 24-hour call requirement sites could be shifted to Level I Trauma Centers. (J Surg Ed 76:387–392. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: Burnout, Student education, Student clerkship director, General surgery, Working hours

COMPETENCIES: Practice-Based Learning and Improvement, Interpersonal and Communication Skills

INTRODUCTION

Medical student 24-hour call has been a fundamental part of the required clinical learning experience over the years. However, many clerkships and medical specialties are switching to a night float system, rather than a 24-hour call experience for medical students.¹ In many instances, there is no overnight experience for certain specialties² and the required general surgery clerkship is often the last remaining medical student course where 24-hour call is a requirement. There have been many studies on 24-hour call among surgical residents,³⁻⁶ particularly with recent changes in work hour restrictions in 2011,⁷ and the subsequent outcomes of the Flexibility in Duty Hour Requirements for Surgical Trainees (FIRST) Trial.⁸

Medical student wellness is affected by high levels of stress⁹, and the adjustment to clinical clerkships from preclinical work requires a different set of skills to succeed.¹⁰ Medical student burnout is prevalent with estimates ranging from 45% to 71%.¹¹ Burnout in the clinical years (years 3 and 4) of medical school has been linked with clerkship organization, particularly for inpatient clerkships and those with overnight call.¹²

The educational utility of 24-hour call has also been questioned, compared to weekday educational activities.¹³ In surgery, 24-hour call is a career expectation of most

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staff surgeons and surgical residents. In many situations, it is an expectation of medical students rotating through surgical clerkships. Medical student participation in this call schedule alone has the opportunity to educate about the lifestyle and rigor of a potential surgical career. Overnight call can offer educational opportunities in emergent consultations, bedside procedures, trauma, and emergency operations; however, these additional experiences must be weighed against medical student wellness and excessive downtime with no educational activities.

The hypothesis of the study was that there would be a preference to continue the 24-hour call requirement among certain groups of medical students, and that there would be identifiable factors found in survey data that could be shown to either improve or dilute the educational experience. The objectives of this study were to assess the medical student perception and experience of a 24-hour call requirement, and to learn if improvements can be made to increase the utility of the 24-hour call requirement.

MATERIALS AND METHODS

The study received approval from the institutional review board. Two surveys were developed for medical students on surgery clerkship using feedback from previous surgical clerkship courses. The survey questions were reviewed by all authors, changes were made, and all authors agreed on the survey questions and format prior to sending to the medical student participants. Survey questions were created to collect demographic information as well as experience and perceptions of the surgical clerkship 24-hour call requirement. Both surveys contained similar questions. A preclerkship survey was created to assess the students' experience and perceptions prior to starting their surgical clerkship and a postclerkship survey was created for assessment at the end of the clerkship.

Demographic information included medical student age, year in medical school, surgical clerkship site, and interest in a career as a surgeon. Those participating in

integrated clerkships were directed to complete the survey based only on their general surgery experience. There were 12 statements about 24-hour call experience and perceptions that were scale-based on agreement with a Likert-type Scale.¹⁴ Free response questions were also included to assess the best and worst aspects of 24-hour call. The last question in the survey was "should the general surgery clerkship continue to require 24-hour call for medical students?" The postclerkship survey included the same content, with 5 additional Likert-type scale questions and 2 questions relating to number of 24-hour call shifts. Again, the students were also given the option to include a free response to answer the best and worst aspects of 24-hour call.

The surveys were created with Qualtrics (Qualtrics, Provo, Utah). Over the course of 1 academic year, all medical students completing a surgery clerkship were sent a link for an optional, anonymous survey 1 week before starting their surgery clerkship (preclerkship survey) and a second survey during the last week of clerkship (postclerkship survey). Integrated clerkship students were also included and were sent preclerkship surveys a week before their integrated experience and postclerkship surveys during the last week of their integrated experience.

Data were compiled and statistical analysis was performed using IBM SPSS Statistics for Macintosh (Version 23.0, Armonk, NY: IBM Corporation). Chi-square analysis was used for categorical variable comparison and the nonparametric Wilcoxon test was used for scale-based responses. Free responses were analyzed for common themes by reviewing word repetitions.

RESULTS

A total of 201 medical students were sent both surveys. The preclerkship survey had a response rate of 70% (n = 140) and the postclerkship survey had a slightly lower response rate of 58% (n = 117). Demographics were similar between the 2 surveys (Table 1). Nine traditional clerkship sites and 3 integrated clerkship sites

TABLE 1. Demographics

	Preclerkship	Postclerkship
Responses (%)	140 (70%)	117 (58%)
Traditional clerkship (%)	114 (81%)	95 (81%)
Average age (SD)	25.9 (2.3)	26.2 (2.4)
Year 3 (%)	138 (99%)	114 (97%)
Interest in surgical career? (%)		
	Yes – 31 (22%)	32 (27%)
	Maybe – 49 (35%)	21 (18%)
	No – 60 (42.9%)	64 (55%)

SD, standard deviation.

were represented. The majority of the responses were from traditional clerkship students (81%, pre and post-clerkship). The average age of the students was 25.9 (preclerkship [SD 2.3]) and 26.2 (postclerkship [SD 2.4]) years. Most of the students (preclerkship 99% and postclerkship 97%) were third year in medical school. A similar number of students were interested in a career in surgery in the pre and postclerkship surveys (22% versus 27%).

The amount of 24-hour call taken by medical students is described in Figure 1. There were 42 students (36%) that did not have any 24-hour call shifts, which consisted of integrated clerkship sites and some sites with a late call rather than a 24-hour call requirement. The majority of students (80%) with 1 to 2 24-hour call shifts thought that it was the right amount of call. The majority of students (70%) with 2 to 5 shifts thought that it was the right amount of call, half of those (50%) with 5 to 10 shifts thought that it was the right amount of call, and a minority (30%) thought over 10 or more shifts was the right amount of call (Table 2).

Perceptions of 24-hour call differed prior to starting clerkship and after completing surgical clerkship. Agreement with statements focusing on 24-hour call are compared between preclerkship and postclerkship surveys

in Table 3. Generally, medical students had less agreement with statements expressing concern about 24-hour call after completing the clerkship. General statements about 24-hour call had similar responses between the pre and postsurvey.

In the free response section, the students thought that trauma/emergency surgery (34%), general experience/preparation for residency (21%), and experiencing continuity of care (18%) would be the best experiences of 24-hour call according to the preclerkship survey. After experiencing call, opinions changed with postclerkship survey yielding somewhat different results: trauma/emergency surgery (20%), one-on-one junior resident teaching (19%), and case variety (15%) were the best experiences. According to the preclerkship survey, the worst experiences were expected to be fatigue/sleep deprivation (69%), schedule and study disruptions (18%), and downtime/lack of educational utility (17%). The worst experiences in the postclerkship survey included downtime/lack of educational utility (21%), schedule and study disruption (18%), and fatigue/sleep deprivation (14%).

Students were also asked if they recommended continuing the 24-hour call requirement for surgery. Students in the preclerkship survey were similarly likely to recommend continuing the 24-hour call requirement as

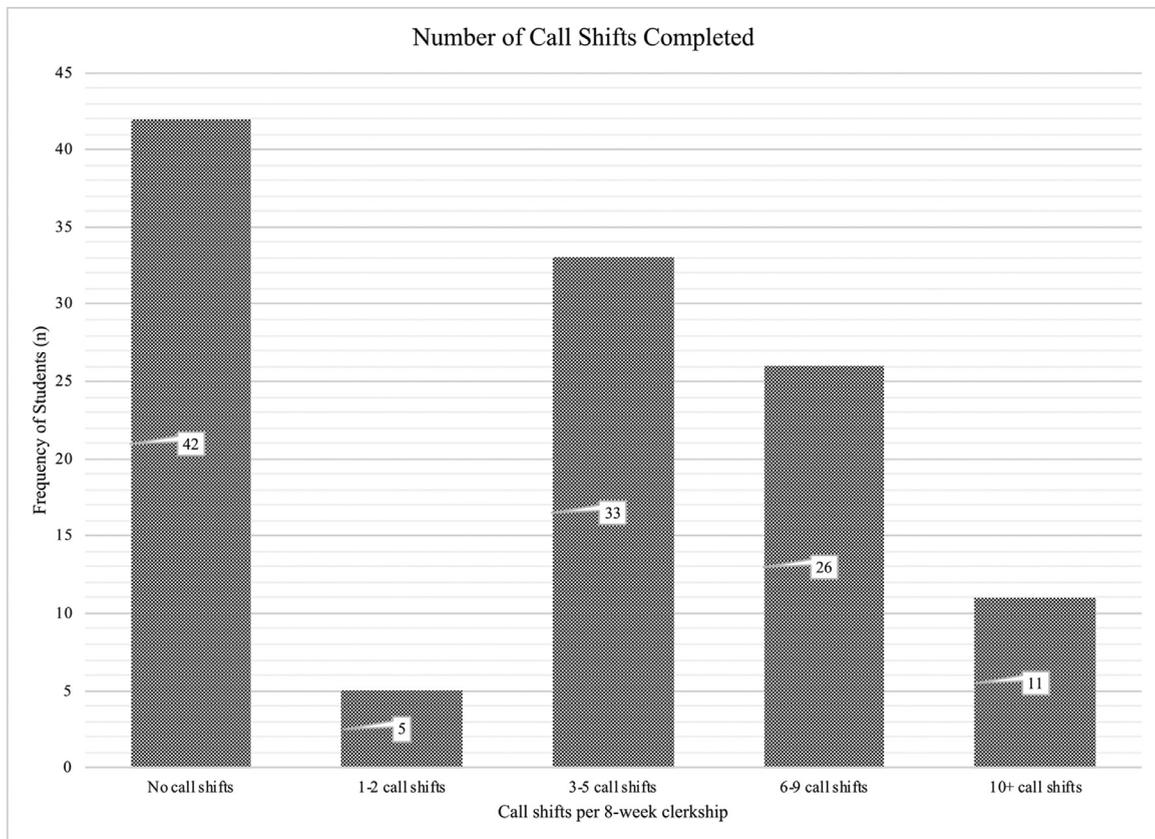


FIGURE 1. Distribution of amount of 24-hour call.

TABLE 2. Recommendation of Continuing 24-Hour Call Requirement According to Number of Call Shifts

	Number recommending continuing call requirement (n)	Percent of total	p value
No call shifts	11	28%	0.003
1-2 call shifts	0	0%	
3-5 call shifts	15	48%	
6-9 call shifts	11	44%	
10+ call shifts	9	90%	

TABLE 3. Comparison of Pre and Postclerkship 24-Hour Call Perceptions

	Preclerkship*	Postclerkship*	p value
General statements			
Helpful preparation for residency	4	4	0.380
Useful educational opportunities	4	4	0.112
Helpful for learning continuity of care	3	3	0.09
Learn about surgical emergencies	4	4	0.248
Prefer night float versus 24-hour call	3	3	0.174
Medical students should not take 24-hour call	3	3	0.787
Concern statements			
Mental health	4	3	0.025
Fatigue	4	3	0.002
Mistakes	4	3	0.002
Study schedule	4	5	0.164
Grades	4	3	0.001

*Preclerkship and postclerkship responses are based on a Likert-type scale, with 1 = completely disagree, 2 = somewhat disagree, 3 = neutral, 4 = somewhat agree, 5 = completely agree.

postclerkship students (44% versus 39%, $p = 0.8$). Students with an interest in surgery were more likely to recommend continuing the 24-hour call requirement after completing the clerkship (55% versus 31%, $p = 0.01$) but the same association was not present in the preclerkship survey (46% versus 35%, $p = 0.2$). Students that rotated at a Level I Trauma Center were more likely to recommend continuing the call requirement (59% versus 33%, $p = 0.008$) but those rotating at a transplant center were not more likely to recommend continuing the requirement (38% versus 43%, $p = 0.6$). If the integrated clerkship students are removed from analysis (considering the traditional clerkship students only), results are similar for the recommendation of continuing the 24-hour call requirement. Those interested in surgery are more likely to recommend continuing 24-hour call (59% versus 28%, $p = 0.003$) and those rotating at a Level I Trauma Center are more likely to recommend continuing 24-hour call (70% versus 43%, $p = 0.009$).

DISCUSSION

This study demonstrates that although concerns and anxiety about the challenge of 24-hour call are high prior to starting

surgery clerkship, students may learn to cope with the experience of long hours and 24-hour call during the clerkship. Sleep deprivation, changes in schedule, study time, and lack of educational utility remain negative experiences of the 24-hour call. Students interested in surgery and those rotating at Level I Trauma Centers were more likely to recommend continuing the 24-hour call requirement.

This study is the only one to examine perceptions of a 24-hour call system for medical students on a surgical clerkship, and the first to measure these perceptions before and after clerkship completion. There was a relatively high survey response rate at 70% preclerkship and 58% postclerkship. Other studies have focused on the transition to a night float system.

Farkas et al. examined night call in a night float system and found that medical students preferred night call in a night float system compared to 24-hour call but students had similar experiences in the rest of their clerkship (overall, operating, and lectures).¹ And while night float may be preferred by some students, others in this study saw 24-hour call as a useful experience for preparing to be a resident. In contrast to Farkas et al., medical students showed no preference in survey data between night float and a 24-hour call system pre and postclerkship.

Another study by McMullin et al. concluded that time spent on surgery call is less educational than normal weekday shifts.¹³ This was also raised as a concern by a portion of the students in this study in free response (downtime/lack of educational activity). Though the educational experience may be diminished for medical students while on 24-hour call, some groups such as those rotating at Level I Trauma Centers and those interested in surgery seemed to have a better experience than others, more often recommending the call requirement to continue. While those interested in surgery have been shown to have better surgical clerkship experiences,¹⁵ trauma centers have not been shown to have an effect on overnight call for medical students.

There were some limitations with this study and survey design. This study only included 1 medical school over 1 academic year. However, over 200 students completed a surgical clerkship and these clerkship locations span 9 sites including integrated rural and metropolitan tracks. One difference that could allow for inconsistency in survey answers is that traditional clerkship students were surveyed after their clerkship while integrated clerkship students were surveyed after their integrated experience (which included surgery, but their surgical experiences are variable during the course of their clerkship). Some of the results that achieved statistical significance only exhibited a change of 1 point on the Likert Scale, and should be interpreted in that context. There are other methods of statistical analysis of Likert scales and there is some debate on the correct method of analysis.¹⁶ Furthermore, given the relatively small sample size, the 12% difference in response rate between pre and postclerkship surveys could allow for some nonresponse bias to the survey results. Finally, some survey validation options were available through Qualtrics, such as forced response, multiple choice questions, and limiting open response to certain formatting constraints; however, this was a relatively small survey population at one institution and additional validation measures were limited.

24-hour call for medical students can provide a useful experience for preparation for residency, where 24-hour shifts are often expected. After experiencing 24-hour call on their surgical clerkship, medical students valued working closely with junior residents, an increased variety of cases, more emergency cases, and trauma. The overall medical student experience and perception of 24-hour call could be improved through a standard amount of call during the 8-week clerkship (likely 5 shifts or less) and by offering 24-hour call for all students at Level I Trauma Centers over hospitals that have less surgical and trauma volume overnight.

CONCLUSIONS

Changes can be made to improve medical student perception of 24-hour call. Medical students have concerns about the experience prior to the clerkship that diminished by its completion. Concerns about sleep deprivation, study schedules, and lack of educational utility remain high after clerkship completion and programs must be cognizant of medical student wellness and burnout. To improve medical student perceptions of 24-hour call, frequency of shifts could be limited and the 24-hour call requirement site could be shifted universally to Level I Trauma Centers.

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