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Surgical Education

Of duty hour violations and shift work: changing the educational paradigm

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Abstract

BACKGROUND: Successful surgical education balances learning opportunities with Accreditation Council on Graduate Medical Education (ACGME) duty hour requirements. We instituted a night shift system and hypothesized that implementation would decrease duty hour violations while maintaining quality education.

METHODS: A system of alternating teams working 12-hour shifts was instituted and was assessed via an electronic survey distributed at 2, 6, and 12 months after implementation. Resident duty hour violations and resident case volume were evaluated for 1 year before and 2 years after implementation of the night shift system.

RESULTS: Survey data revealed a decrease in the perception that residents had problems meeting duty hour restrictions from 44% to 14% at 12 months ($P = .012$). Total violations increased 26% in the 1st year, subsequently decreasing by 62%, with shift length violations decreasing by 90%. Resident availability for didactics was improved, and average operative cases per academic year increased by 65%.

CONCLUSIONS: Night shift systems are feasible and help meet duty hour requirements. Our program decreased violations while increasing operative volume and didactic time.

In an effort to provide a safer working environment for residents and improve overall patient care and safety, work hour restrictions have been gradually implemented within Accreditation Council on Graduate Medical Education (ACGME) accredited residency training programs over the last several years. In 2011, further restrictions were implemented, including maintenance of the 80-hour work week, while further reducing hour requirements per shift to 28 hours for senior residents and 16 hours for interns. This change in requirements led to modifications in the structure of many residency programs to remain compliant. Although some favor the new restrictions, many within the surgical community voiced concern suggesting that reduced work hours and shift length would be detrimental to resident education leading to decreased operative case volume among residents and decreased time for didactic learning.[1–3]

Successful surgical education requires a balance of operative experience and nonoperative educational activities within the limits of the ACGME duty hour requirements. Several studies have looked at the effects of the implemented changes with mixed results. For example, orthopedic surgery literature includes support for decreased fatigue and an improvement in quality of life, yet questions

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the potential negative effect on surgical skill, operative outcomes, and overall patient outcomes.[1,2] Other articles, however, found no change in the overall education time and observed either no change or an increase in operative time and volume with the new restrictions.[3,4]

Our goal was to examine the overall impact of these changes within our own institution. The UCSF–Fresno General Surgery Residency Program is a 5-year program with 5 categorical general surgery residents per year. Residents rotate on various surgery services, including trauma, general surgery, hepatobiliary, endocrine, vascular, burns, and plastic surgery. Of these, the trauma and acute care surgery service at our busy level I trauma center had the most difficulty with ACGME duty hour compliance. Therefore, a 12-hour day and/or night shift (night shift) system was designed to address work hour violations on our trauma service. We hypothesized that its implementation would decrease duty hour violations while maintaining quality resident education for all resident services.

Methods

We designed a system of 12-hour shifts for our trauma service, which provides full 24-hour coverage from Sunday night through Friday. Additional cross-coverage is provided Friday night through Sunday by 2nd through 5th year residents not on the trauma service. The day shift is from 6:30 AM to 6:30 PM and the night shift is from 6:30 PM to 6:30 AM. Structured team handoffs occur at each shift change during the 1st portion of the incoming shift. During the night to day transition, the night team meets with the day team to report overnight events and new admissions. Similarly, during the day to night transition, the day team reports on new admissions, patient status changes, discharges, and operative case findings. These handoffs usually take approximately 30 to 45 minutes.

During the day shift, each service is fully staffed with varying numbers of senior and junior residents, as well as attending surgeons and physician assistants. The night shift team is composed of 1 intern, 1 junior resident, 1 senior resident, and 1 in-house attending, with all personnel having specific coverage assignments. The intern covers the surgical floor patients of all of our surgical services. The junior resident covers the surgical, trauma, and burn intensive care units, as well as all general surgery, vascular, and trauma consults with the assistance of a trauma physician assistants. The intern and junior resident are overseen by the senior resident and attending. In addition, there is a backup team available if the night shift team becomes overwhelmed. This team includes a senior resident and attending on call at home and is typically used approximately 1 to 2 times per month. The total number of residents covering these services during the day and night did not change with implementation of the night shift system, but the service coverage schedule was redesigned, resulting in an increase in the amount of time spent on the trauma service over the course of residency.

To preserve resident education with this system, resident conferences are scheduled from 7:30 AM to 8:30 AM 3 days a week so that overnight interns can attend but remain compliant with the 16-hour requirement. This conference time is protected from clinical duties, and all residents are required to attend.

We prospectively evaluated the opinions of department personnel regarding these changes. An anonymous multiple choice electronic survey (Survey Monkey) was designed and distributed to all residents, faculty, physician extenders, and administrative personnel (administrative assistants and residency and fellowship coordinators) at 2, 6, and 12 months after implementation of the new night shift system. This survey examined the subjective effectiveness of the new night shift system on resident education, perception of problems with duty hour violations within the institution, and thoughts concerning the effect on patient care (Fig. 1). This was distributed via e-mail and was also available in paper form.

In addition, we examined duty hour violation details, ACGME case logs for chief residents, and the average case load per academic year for the year before and the 2 years after implementation of the night shift system to determine its effect on operative volume for residents.

Statistical analysis was performed using chi-square tests with significance attributed to a P value less than .05. This study was approved by the UCSF Fresno/Community Regional Medical Center Institutional Review Board.

Results

Fifty-five individuals were invited to take the survey. Response rates varied at each time point, but were noted to be highest among residents (Table 1).

Experience on the floors, operative experience, didactic learning, and one on one time with attendings were considered the most important factors contributing to resident education. Participants reported that the most prominent barriers to resident education were postcall days, patient volume, and operative load interfering with teaching rounds. There was little change in these responses between the 3 time points.

Survey results revealed a decrease in the number who believed residents had a problem meeting duty hour restrictions (44% at 2 months, 14% at 12 months, $P = .012$). In addition, there was consistent agreement that night shift improved resident availability for didactic education (67% at 2 months, 79% at 12 months, $P = .73$). After 1 year of the night shift, 86% of participants thought the new system was a sustainable change, and the majority (71%) thought that it was a change for the better.

The initial survey reported little concern that the implementation of night shift would have any effect on patient care outcomes. However, 34% of those who responded to the survey at 6 months were very concerned that there would be adverse effects to patient care. After 1