To Float or Not To Float, A Night time Solution: An Interrupted Time Series Comparing PGY-1 Residents

Abstract

**Objective:** With resident work hour restrictions, there is concern that training is compromised. Nearly all residencies have adopted a night float system, but the program at Banner University Medical Center-Phoenix started an innovative program for PGY-1 residents called Nighttime Alternative Program/Study (NAPS) to meet work hour requirements and enhance knowledge focusing on basic science material. Each PGY-1 resident rotates working 16 hours overnight followed by 32 hours for rest and study. A prepared curriculum for the NAPS rotation includes assigned reading, teaching sessions, and exams with a focus on components of basic anatomy and physiology in Obstetrics, Gynecology, and Reproductive Endocrinology.

**Methods:** CREOG scores and Accreditation Data System procedures from PGY-1 residents in 2010 and 2011 (n=16) were compared to those residents who participated in the NAPS program in 2012, 2013, 2014, 2015 (n=32). Satisfaction was assessed by an online anonymous survey of the PGY-1 residents who participated in the NAPS curriculum.

**Results:** CREOG scores were not statistically significant (P= .23), while Accreditation Data System procedures varied. In Obstetrics, spontaneous vaginal delivery was not significant (P=.147), while forceps, vacuum, and cesarean deliveries were decreased for NAPS interns (P=.041, 0.046 and <.01, respectively). Gynecology experience was similar between groups (P=.404 and 0.070). 100% of PGY-1 residents reported satisfaction with the NAPS program overall, while 97% reported they had an adequate clinical experience during NAPS.

**Conclusion:** NAPS is an innovative schedule for PGY-1 residents and does not greatly affect the knowledge base or compromise technical experience at the PGY-1 level. Based upon residents’ satisfaction, the program continues. This can serve as a model for other residency programs.

Introduction

In 2011, all residency programs were required by the Accreditation Council for Graduate Medical Education (ACGME) to further restrict work hours for first year residents. The maximum number of consecutive intern work hours is now 16. With resident work hour restrictions, there is concern that OB/GYN training can be compromised [1-4]. Nearly all residencies have adopted a night float system. There are concerns that morale can be mixed or low for participants [5]. There is also concern for compromised educational value during night float systems, as they may emphasize hospital service over education [6]. The program at Banner Good Samaritan in Phoenix, AZ (now Banner University Medical Center – Phoenix) started a resident-designed innovative program in 2011 called Nighttime Alternative Program/Study (NAPS) to meet work hour requirements and enhance education with a focus on foundational knowledge.

Each PGY-1 resident rotates on NAPS for 4 or 5 months. During these months, the resident works 16 hours overnight followed by 32 hours for rest and study. A faculty-designed curriculum for the NAPS rotation includes assigned reading, optional individual teaching sessions by a senior faculty member and proctored exams at the end of each two week “module”. Each “module” focuses on basic obstetric and gynecology concepts such as normal labor, pelvic anatomy, embryogenesis and menopausal transition. Assigned readings include textbook chapters from *Williams Obstetrics*, *Williams Gynecology*, and *Practice Bulletins* by The American College of Obstetricians and Gynecologists (ACOG). This dedicated study program in the PGY-1 year sets a solid medical knowledge base to build upon in subsequent years and sets residents on the road to self-directed, life-long learning. PGY 2, 3, and 4 residents maintain a traditional 24-hour call, which is similar to hours as an OB/GYN attending.

There are many subjective and objective measurements of resident performance and experience available to faculty. Two objective measures of intern training experience are the CREOG exam and the logging of surgical procedures performed. The annual CREOG in-training examination is required for each resident by the Council of Resident Education in Obstetrics and Gynecology (CREOG). Residents also record every surgical procedure performed in a resident case-log system on the ACGME website, the Accreditation Data System (ADS). This ACGM-
required online program permits comparison of procedural numbers between programs and between years.

**Methods**

PGY-1 residents at our institution were compared before and after the work-hour restriction changes. Exemption by our institutional review board was obtained. CREOG scores and ADS data of PGY-1 residents prior to the work hour restriction in 2010 and 2011 (n=16) were compared to those PGY-1 residents who participated in the NAPS program in 2012, 2013 and 2014 (n=24). Medians were compared using a Wilcoxon rank sum test. Overall standardized CREOG scores were used from the PGY-1 year. ADS data using both ‘assistant’ and ‘surgeon’ roles was used at the completion of the PGY-1 year. Only gynecology procedures appropriate for the PGY-1 level were included (i.e. laparoscopy, hysterectomy).

Resident satisfaction was assessed by anonymously polling all PGY-1 residents who participated in the NAPS curriculum. The poll asked participants if they were satisfied or not-satisfied with the NAPS program and whether they would recommend continuing or discontinuing the program for future years.

**Results**

Differences in CREOG scores between groups were not statistically significant (pre and post scores were 184 and 181 respectively, *P*=.672). Core obstetric and gynecology procedures varied between groups as shown in Table 1. Spontaneous vaginal delivery numbers were not significantly different, while forceps, vacuum, and cesarean delivery were decreased for NAPS interns (*P*=.041, .046 and <.01). Cesarean numbers were most significant with pre-NAPS versus post-NAPS cases 109 and 77. Gynecology experience (laparoscopy and hysteroscopy) was similar between groups. All PGY-1 residents (100%) reported satisfaction with the program and recommended its continuation.

**Table 1: Core obstetric and gynecology procedures of PGY-1 Residents.**

| Cases                      | Pre-NAPS (2010,2011)* (n=16) | Post-NAPS (2012, 2013,2014)* (n=24) | *P*
|---------------------------|------------------------------|------------------------------------|------|
| Spontaneous Vaginal Delivery | 257                          | 267                                | .147 |
| Forceps-Assisted Vaginal Delivery | 5                            | 2.5                                | .041 |
| Vacuum-Assisted Vaginal Delivery | 11                           | 9                                  | .046 |
| Cesarean Delivery          | 109                          | 77                                 | <.01 |
| Laparoscopy                | 19                           | 15.5                               | .404 |
| Hysteroscopy               | 31.5                         | 29                                 | .07  |

PGY-1: Post Graduate Year 1; NAPS: Nighttime Alternative Program/Study

*Median values of cases.

**Discussion**

Nighttime Alternative Program/Study (NAPS) is an alternative option for PGY-1’s which is in compliance with work hour restrictions. It does not greatly affect the intern knowledge base or compromises the core technical experience. It also maintains a high level of resident morale. The dedicated study program in the PGY-1 year establishes foundational knowledge and understanding. This is built upon in subsequent years and sets residents on the road to life-long learning. This can serve as a model for other programs to adopt for PGY-1 residents. It maintains a traditional call schedule for subsequent years, which prepares graduates for practice as an Attending physician. This study has several limitations. While others have compared residency graduates, ours compares PGY-1 residents only. The number of interns to compare is small, as only eight residents participate per year. Variations in CREOG scores are influenced by multiple factors outside of work, including test-taking skills, study habits, sleep deprivation, knowledge base and USMLE scores. Procedural numbers have varied slightly each year based also on overall hospital volume. For example, cesarean delivery procedure numbers increase in subsequent years. The selection of appropriate gynecology procedures for PGY-1 residents is based upon the authors’ opinions. For example, procedures for incontinence and invasive cancer have traditionally been performed by upper level residents at our institution. However, this may vary at other institutions.

Based upon residents’ satisfaction, the program continues. An additional limitation of our study is that for comparison sake, not all of our residents had previously participated in a night float program as medical students. Therefore there is no good comparison for satisfaction. Additional study is needed, including a comparison between NAPS and night float in similar residency programs.

**References**

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