The Nature and Scope of Moonlighting by Radiology Trainees

Michael F. McNeeley, MD, Somnath J. Prabhu, MD, Eric J. Monroe, MD, Ramesh S. Iyer, MD

Rationale and Objectives: The practice of moonlighting by trainees is a longstanding controversy; however, the resident point of view remains distinctly underrepresented in the radiology literature. We report the resident perspective on the moonlighting practices of radiology trainees.

Methods: Survey data were collected from resident members of the Association of University Radiologists representing 84 training programs in the United States to assess their routine and extracurricular clinical responsibilities. Descriptive statistics were used to analyze these data.

Results: Moonlighting is practiced by radiology trainees at nearly three-fourths of the programs represented in this survey. Interpreting diagnostic imaging (85.5%) and monitoring contrast administrations (72.6%) are the most common duties performed. Twenty-one percent of moonlighting trainees perform procedures (excluding diagnostic fluoroscopy) in their extracurricular positions; of these, most (61.5%) are without attending supervision. Most trainees that moonlight spend 1 to 10 hours weekly doing so while averaging a 59-hour workweek at their primary jobs.

Conclusions: The clinical duties of moonlighting trainees may be more diverse than has been previously recognized. Although major discrepancies between overnight radiology trainee interpretations and attending final interpretations have been shown to be infrequent, the consequences of trainees performing procedures and monitoring adverse contrast reactions without attending supervision are unknown. The financial and professional benefits of moonlighting must be weighed against the potential for harm. Our data suggest that most moonlighting radiology trainees operate within the Accreditation Council for Graduate Medical Education–mandated 80-hour weekly work limit; the mandatory 8-hour break between shifts and 24-hour continuous duty limit may pose logistical challenges.

Key Words: Graduate medical education; moonlighting; radiology education; resident finances; wellness.

Resident physicians are a heavily leveraged breed. Eighty-six percent of the US medical school class of 2011 will graduate with medical student loans, with a median amount of $162,000 (1); one-third will have incurred $200,000 or more in medical education debt. As interest accrues over a 25- to 30-year repayment period, the true financial burden of medical education becomes much higher. It has been shown that residents have fewer assets, greater consumer debt, and smaller retirement funds when compared to members of the general public with post-college degrees (2). A 2002 survey of internal medicine trainees found that 52% had insufficient funds to purchase textbooks and work-related equipment, and that nearly one-third could not afford the required fees for their board certification exam (3). Similarly, many radiology residents bear considerable responsibility for American Board of Radiology certification fees, licensing costs, and radiologic-pathologic course (American Institute for Radiologic Pathology) expenses, which may amount to 16% of their annual salary (4,5).

In light of these circumstances, many resident physicians may perceive an acute need for supplementary income. Indebtedness is highly associated with the pursuit of moonlighting opportunities (6–11). However, in addition to its economic benefits (12,13), some authors have emphasized the educational value of the practical experience gained through these additional responsibilities (14–16).

The purpose of this study is to determine the nature and scope of moonlighting by radiologists-in-training as reported by the residents themselves. We hypothesize that moonlighting by radiology residents is practiced more widely and with greater practice variety than has been recognized previously.

METHODS

This investigation was exempted from full review by the institutional review board of the University of Washington. In May 2012, a cross-sectional anonymous electronic survey was distributed to all resident members of the Association of University Radiologists with known email addresses via a list server; 173 unique American training programs were

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From the Department of Radiology, University of Washington, Seattle Children's Hospital, 1959 Pacific Ave NE, Box 357115, Seattle, WA 98195 (M.F.M., S.J.P., E.J.M., R.S.I.). Received June 30, 2012; accepted August 1, 2012. **Address correspondence to:** M.F.M. e-mail: mcneeley@u.washington.edu

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represented by those contacted. The survey questions are reproduced in the Appendix. Responses were gathered for 2 weeks, with a reminder email distributed after 1 week. Respondents were assured of confidentiality; however, institution name was requested to identify responses from the same institution. When multiple responses from a single institution were received, the answers were composited to maximize completeness without introducing redundancy. Mode responses were selected where one existed and for questions that included "don't know" as a possible answer, a definitive response was given precedence over an uncertain response from a same-institution colleague. If there was no mode, preference was given to the reply of the respondent with the most complete survey form. All comments were preserved and concatenated for each question.

RESULTS

There were 165 responses to our study over the 2-week period. Eight respondents were from outside the United States (Canadian programs) and 17 surveys were incomplete; these responses were excluded from the analysis cohort. In all, 140 US radiologists-in-training represented 84 distinct institutions, with 54 respondents from unique institutions and 86 respondents pooled into small groups representing 30 institutions (overall institutional response rate 48.6%). Because there were different response rates for some questions, the total denominator numbers are specified and percentages are calculated with the relevant denominator for the particular question.

Of the 84 institutions represented in this study, 74% (or 62 of 84) reported that moonlighting is pursued by trainees in their program (Fig 1). Of the 22 institutions that do not participate in moonlighting, 73% (16 of 22) indicated that local market forces (such as a lack of moonlighting opportunities) were a significant barrier, with three free-text comments specifying that malpractice insurance premiums were prohibitively expensive for the local moonlighting market; 55% (12 of 22) reported that program director disapproval was a significant barrier to moonlighting; and 14% (3 of 22) attributed a general lack of interest on the part of the residents in their program. Eight responses indicated multifactorial barriers to moonlighting (Table 1).

Of the 62 representatives of institutions with moonlighting opportunities, 40% (25 of 62) indicated that their department actively encourages resident moonlighting; 58% (36 of 62) indicated that moonlighting is allowed, but not actively encouraged; one respondent indicated that moonlighting is discouraged, but occurs regardless (Table 2). The classes (categorized by postgraduate year, or PGY) participating in moonlighting are illustrated in Figure 2. All moonlighting programs (62 of 62) involve their senior (PGY-5) residents and nearly all (93.5%, or 58 of 62) involve their PGY-4 residents in moonlighting activities. Most programs (75.8%, or 47 of 62) include PGY-3 residents in the moonlighting pool. Only half (31 of 62) of moonlighting programs include

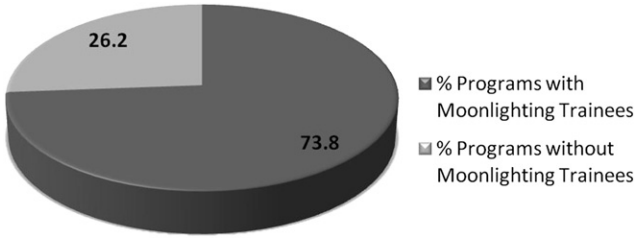

Figure 1. Participation in moonlighting activities by radiology trainees, responses by program representatives.

TABLE 1. Factors Influencing the Decision not to Moonlight

Barriers to Moonlighting	*n*	%*
Market forces	16	72.7
Lack of interest	3	13.6
Administrative disapproval	12	54.5
Total	31†	N/A

*Of 22 programs without moonlighting opportunities.
†Reflects 8 multifactorial responses.

fellows, and a minority of moonlighting programs (27.4%, or 17 of 62) have opportunities for first-year (PGY-2) residents. The majority of moonlighting programs (82.3%, or 51 of 62) treat all members of any given class (PGY level) identically with respect to moonlighting, in the absence of departmental compliance issues (Table 2). Free-text comments were collected from 4 of the 11 programs that distribute moonlighting opportunities unequally within each class; three of these comments indicated that opportunities are handed out first come, first serve; one comment indicated that internal moonlighting is distributed equally, whereas external moonlighting opportunities are offered by invitation only (no specific criteria were described).

The clinical responsibilities for moonlighting residents are summarized in Figure 3. Most programs with moonlighting opportunities provide diagnostic services and/or contrast coverage (monitoring for adverse events after administration of intravenous contrast agents) overnight. When procedures (not including diagnostic fluoroscopy) are among the trainees' moonlighting duties, most are performed without attending supervision (61.5%, or 8 of 13 respondents; Table 2). Of the eight respondents who indicated that procedures are performed without attending supervision by moonlighting trainees from their institution, only five report that fellows are included in their moonlighting pools. One institution has opportunities for paid image acquisition (performing barium swallow evaluations) after hours; no institutions reported performing ultrasound examinations after hours for pay.

Of the 53 programs that interpret diagnostic imaging as a moonlighting activity, the majority of participant trainees are responsible for radiographs, computed tomography studies, magnetic resonance studies, and diagnostic ultrasound, with computed tomography being the modality most commonly covered (Fig 4). Less than half of these programs