

Emergency Radiology Practice Patterns: Shifts, Schedules, and Job Satisfaction

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Abstract

Purpose: To assess the practice environment of emergency radiologists with a focus on schedule, job satisfaction, and self-perception of health, wellness, and diagnostic accuracy.

Methods: A survey drawing from prior radiology and health care shift-work literature was distributed via e-mail to national societies, teleradiology groups, and private practices. The survey remained open for 4 weeks in 2016, with one reminder. Data were analyzed using hypothesis testing and logistic regression modeling.

Results: Response rate was 29.6% (327/1106); 69.1% of respondents (n = 226) were greater than 40 years old, 73% (n = 240) were male, and 87% (n = 284) practiced full time. With regard to annual overnight shifts (NS): 36% (n = 118) did none, 24.9% (n = 81) did 182 or more, and 15.6% (n = 51) did 119. There was a significant association between average NS worked per year and both perceived negative health effects ($P < .01$) and negative impact on memory ($P < .01$). There was an inverse association between overall job enjoyment and number of annual NS ($P < .05$). The odds of agreeing to the statement “I enjoy my job” for radiologists who work no NS is 2.21 times greater than for radiologists who work at least 119 NS, when shift length is held constant. Radiologists with 11+ years of experience who work no NS or 1 to 100 NS annually have lower odds of feeling overwhelmed when compared with those working the same number of NS with <10 years’ experience.

Conclusion: There is significant variation in emergency radiology practice patterns. Annual NS burden is associated with lower job satisfaction and negative health self-perception.

Key Words: Emergency radiology, afterhours, night, radiology, shift work

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INTRODUCTION

An evolving health care landscape has dramatically changed the practice of radiology over the past two decades [1]. Rising imaging volumes and demand for contemporaneous after-hours interpretations have altered

shifts and schedules for many radiologists. In part, these forces supported teleradiology (T-rad) practice growth and sustained the rise of the emergency radiology (E-rad) subspecialty [2,3]. Along with larger systemic shifts, these practice environment changes have been accompanied by a growing level of unhappiness and burnout among radiologists [4-8].

E-rad and T-rad practice patterns are similar in structure and clinical coverage, and teleradiologists are active in the American Society of Emergency Radiology [9]. These two groups of radiologists have a greater likelihood of engaging in after-hours shift work, defined as work occurring outside of the typical diurnal workday [10]. It has been well documented that after-hours shift work can have adverse physical, social, and psychological effects on employees [10-12]. In a 2014 survey, emergency medicine physicians were the least happy medical specialty, in part because of their atypical schedules and

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lack of control over their clinical work [4,5]. Isolation and lack of control are also risks for radiologist dissatisfaction and burnout [5,13]. E-rad and T-rad have similar practice patterns in regard to potential isolation, atypical schedules, and lack of clinical control.

It has been shown that this group of radiologists has higher rates of burnout and turnover [5,12]. Yet, to our knowledge, a comprehensive survey of the status of this subspecialty workforce has never been conducted. The goal of our study was to characterize the composition of the E-rad and T-rad workforce and to understand the spectrum of practice environments. Additionally, we sought to identify factors that increased job satisfaction, career longevity, and perceived diagnostic accuracy, as well as the perception of personal health. This information can help leaders of national E-rad/T-rad organizations in guiding policy, individual radiologists in critically evaluating employment opportunities, and local administration in creating sustainable clinical coverage.

METHODS

Survey Construction

Survey questions were written and reviewed by four attending academic emergency radiologists (including two division directors) and one teleradiologist. Questionnaire construction was based on pre-existing literature from other medical fields, concepts most relevant to the practice of emergency radiology, and issues related to radiologists' quality of life. The Emory University institutional review board granted an exemption for this project. The survey was constructed in digital form via Qualtrics (Qualtrics, Provo, Utah) and reviewed for errors and internal consistency by the authors.

Survey Distribution

The distribution intent was to capture a representative fraction of practicing emergency radiologists and teleradiologists. To accomplish this, we compiled e-mail addresses from a variety of sources, including the American Society of Emergency Radiology members' directory, Virtual Radiologic Professionals (Eden Prairie, Minnesota), and emergency/overnight radiologists at six large (exceeding 50 total physicians) private practice groups. These groups had overlap among individuals; however, to protect the security of these proprietary e-mail lists, the individual names and e-mail addresses were not made available to all authors and could not be cross-referenced. In total, there were 1,496 e-mails distributed; 140 e-mails were returned as invalid or out of office, and there are estimated to be 250

overlapping individuals who received two e-mails. Approximately 1,106 unique recipients received the survey. An e-mail accompanying the survey indicated that radiologists should complete the survey only once. Unique internet protocol (IP) addresses were collected during the survey as identifiers, and no two IP addresses were the same.

The survey was distributed in April 2016, and the total survey period lasted 4 weeks. One reminder was sent to the recipients. The survey was closed on May 1, 2016. A total of 1,496 e-mails were distributed, and 140 e-mails were returned, leaving 1,356. Based on the lists used, maximum possible overlap is 400 (total list less societal members) and minimum overlap is zero; with 327 responses, the possible response rate range is 34.2% (327/956) to 24.1% (327/1,356). Our estimate based on best-available knowledge is 29.6%, very near the center of this range.

Data Collection and Analysis

The survey results were exported from Qualtrics into an Excel database and prepared for analysis by reducing responses to numeric codes. For categorical variables, frequency and percentage were calculated and presented. Association was assessed with Pearson χ^2 test and Fisher exact test. Logistic regression models were created to evaluate the effect of shift or schedule parameters on overall job enjoyment and chance of feeling overwhelmed during work. Overnight shift number and shift length were divided into levels, with respondents falling into one level for each variable. The logistic regression model for job enjoyment held one variable constant while changing the other. This allowed us to calculate the odds ratio for the variable that was changed while adjusting for the variable held constant. The significance level is set at .05. SAS 9.4 was used for data analyses and management.

RESULTS

Response rate was approximately 29.6% (327/1,106). Of the 327 total responders, 69.1% ($n = 226$) were greater than 40 years of age, 73% ($n = 240$) were male, and 87% ($n = 284$) practiced full time. The respondents represented all US geographic regions: 31.6% ($n = 102$) in the South, 21.7% ($n = 70$) in the West, 18.6% ($n = 60$) in the Northeast, and 18.0% ($n = 58$) in the Midwest; 6.5% ($n = 21$) did not give a specific geographic location, but indicated that they practiced in multiple states, and 3.7% ($n = 12$) practiced internationally. The respondents were 54.1% ($n = 177$) private practice, 41.9% ($n = 137$) academic, and 4% ($n = 13$) hybrid. Fellowship training was diverse (Table 1).

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