

Contents lists available at [ScienceDirect](#)

Clinical Radiology

journal homepage: www.clinicalradiologyonline.net

A retrospective review of registrar out-of-hours reporting in a university hospital: the effect of time and seniority on discrepancy rates

V. Lam, J.A. Stephenson*

Gastrointestinal Imaging Group, Department of Radiology, University Hospitals of Leicester, Leicester Royal Infirmary, UK

ARTICLE INFORMATION

Article history:

Received 5 September 2017

Accepted 15 January 2018

AIM: To assess the influence of time, intensity, and trainee seniority on radiology registrars' major and minor discrepancy rates during weekend reporting at a university teaching hospital.

MATERIALS AND METHODS: A 12-month retrospective review was performed of out-of-hours trainee provisional reports for computed tomography (CT) and magnetic resonance imaging (MRI) in a university teaching hospital. From Friday 9.00 pm to Sunday 9.00 pm, the out-of-hours service is provided by a single registrar rotating every 12 hours. A busy shift was defined as more than 24 reports issued during the shift. A senior trainee was defined as having more than 2 years' experience on the on-call rota. Reports were compared to subsequent subspecialist consultant review with all discrepancies collected. Discrepancy rates were calculated for junior/senior registrars, time of shift, and for busy/less busy shifts.

RESULTS: The total discrepancy rate was 11.1%, with a major discrepancy rate of 3%. Junior registrars had a lower total discrepancy rate (9.7% versus 12.2%, $p=0.0065$). Although there was no difference between major discrepancies, junior trainees made fewer minor discrepancies (7.1% versus 8.93%, $p=0.03$). The discrepancy rate was higher at night (12.3% versus 10.4%, $p=0.0418$). On a less busy shift, more discrepancies were made (12.8% versus 10%, $p=0.0001$).

CONCLUSION: The major discrepancy rate of trainees is low. More discrepancies are made at night, and trainee seniority does not mitigate this problem. Night shifts are less busy in comparison to day shifts, which may explain why less busy shifts appear to yield more mistakes.

Crown Copyright © 2018 Published by Elsevier Ltd on behalf of The Royal College of Radiologists. All rights reserved.

Introduction

There is a huge demand for accurate imaging services, especially in the acute setting, worldwide.¹ This has

manifest as year-on-year increases in the number of radiology examinations performed, with a 42% rise in the past 10 years in the UK from 28.8 million to 40.9 million in 2014.² Locally, the average number of scans performed on a Saturday was 24 in 2007, and has increased to 120 in 2017. This is, in part, due to the high diagnostic specificity and increased availability of computed tomography (CT); these complex investigations can have a huge positive, but sometimes negative, impact on patient care depending on the accuracy and timeliness of the report. Unfortunately,

* Guarantor and correspondent: J. A. Stephenson, Gastrointestinal Imaging Group, Department of Radiology, University Hospitals of Leicester, Leicester Royal Infirmary, Infirmary Square, Leicester LE1 5WW, UK. Tel.: +44 0300 303 1573.

E-mail address: James.Stephenson@uhl-tr.nhs.uk (J.A. Stephenson).

<https://doi.org/10.1016/j.crad.2018.01.012>

0009-9260/Crown Copyright © 2018 Published by Elsevier Ltd on behalf of The Royal College of Radiologists. All rights reserved.

this rise in workload has not been matched with an expansion in workforce.^{1–3} As a result, within many hospitals, radiology registrars provide a crucial service in providing provisional reports for out-of-hours imaging with a subsequent review by consultants the day after.

There are many benefits to trainees interpreting studies out-of-hours: it is critical in the development of trainee proficiency, decision making, and autonomy.⁴ Trainees are given the opportunity to analyse complex cases. Furthermore, multiple readers may improve interpretation accuracy and eventual patient care⁵; however, on the background of increasing demand, there is a renewed focus on the possible effects on patient care. Multiple studies in the literature have demonstrated low registrar discrepancy rates, even if they are limited to a particular imaging study or body part.⁶

There are many challenges to out-of-hours shift work, including the disturbance of the normal sleep–wake cycle, leading to fatigue, which may adversely affect an individual's performance.³ A study of anaesthesiologists showed reduced performance in learning and memory after an overnight on call shift.⁷ Further studies analysing nursing vigilance and proficiency when performing vital tasks, demonstrate a general deterioration in capability after long shifts.⁸ Another crucial factor to take into account is workload, a radiologist in the USA faced litigation for medical malpractice for missing a diagnosis of breast cancer because they had interpreted too many radiographs during the day and were accused of being overworked.⁹ Some of these stresses may be moderated by a trainee's experience and training, with an expectation that more senior trainees will report fewer discrepancies.¹⁰

The aim of this study was to assess the influence of time of day, shift intensity/workload, and trainee seniority on radiology registrars' major and minor discrepancy rate during out-of-hours weekend reporting at a university teaching hospital.

Materials and methods

A retrospective review was performed of trainee on-call provisional reports for CT and magnetic resonance imaging (MRI) in a university teaching hospital over a 12-month period between 1 August 2013 and 5 August 2014. From Friday 9.00 pm to Monday 9.00 am, the out-of-hours radiology service is provided by a resident radiology registrar rotating every 12 hours, and this allowed for direct comparison between each 12-hour period. The decision to start at Friday 9.00 pm to Sunday at 9.00 pm rather than Saturday 9.00 am to Monday at 9.00 am was made as Friday and Saturday nights tend to be busier than Sunday night and relate closer to the workload from Saturday and Sunday daytime shifts. A busy shift was defined as >24 reports issued over the duration of a shift, based on the Royal College of Radiologists (RCR) guidelines for the consultant rate of reporting for complex cross-sectional imaging. A senior trainee was defined as having >2 years' experience on the on-call rota issuing provisional reports. At this time, 22

registrars participated in the on-call rota. Supervision was provided from a non-resident consultant on-call.

Reports generated by trainees for CT and MRI studies during each shift were reviewed using the hospital radiology information system. Subsequent subspecialist consultant review, available the next day, was used as the standard. Reports are issued with a qualifying statement that a consultant review will be provided the next day. There were 30 consultants, composed of five neuroradiology, five musculoskeletal, and 20 body radiologists of different expertise reviewing their specialty scans. The only out-of-hours MRI performed and provisionally reported by the on-call specialist registrar during the study period were suspected cauda equina. Ultrasound and plain film reports were excluded.

Data collection

Data were manually entered into the Microsoft Office Excel 2013 spreadsheets. The total number of scans per shift was collected. In cases where a discrepancy occurred, the discrepancy type (major or minor), seniority of trainee, time of the report and the modality were recorded. Data on type of study (body part) and disturbances were not recorded.

Discrepancies

Major and minor discrepancies were defined at the outset of the study: a major discrepancy comprised a change (or potential to change) in diagnosis or treatment as a result of either addendum report or CT auditor review. A minor discrepancy occurred where there were minor issues in provisional reports unlikely to result in harm or change in management.¹

Statistical analysis

The total number of discrepancies per shift was analysed and discrepancy rates were calculated for junior and senior registrars; for early and late; and for busy and less busy shifts. Fischer's two tailed exact test was used.

Results

A total of 4,866 examinations were reported over a total of 212 shifts. The total number of CT examinations reported was 4,816 (during the day 3,054, at night 1,762), and the total number of MRI examinations was 50. The average number of CT examinations per shift was 22.7 with significantly less reported overnight (day 28.8, night 16.6). There was no significant difference between the caseload distributions at day and night, with trainees reporting significantly more CT head examinations.

Senior trainees worked significantly more shifts over the study period compared to more junior colleagues (123 versus 89, $p=0.0013$) both in the day (58 versus 48) and at night (65 versus 41), thus reporting significantly more scans in total (2,787 versus 2,079, $p=0.0001$). As a proportion of shifts, seniors also worked more night shifts (senior=52.8%

Download English Version:

<https://daneshyari.com/en/article/8786439>

Download Persian Version:

<https://daneshyari.com/article/8786439>

[Daneshyari.com](https://daneshyari.com)