



Beyond image interpretation: Capturing the impact of radiographer advanced practice through activity diaries



B. Snaith*, R.C. Milner, M.A. Harris

Mid Yorkshire Hospitals NHS Trust, Aberford Road, Wakefield, WF1 4DG, UK

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ABSTRACT

Background: There is limited evidence of the impact of radiographers working in advanced roles beyond task substitution. This study reviews the contribution of advanced (and consultant) practitioner radiographers to service delivery whilst reporting radiographs and demonstrates the impact this has on patients and staff, both internal and external to the imaging department.

Method: The study was a prospective exploratory study using activity diaries to allow interval sampling when individuals were rostered to report. Data was coded using a compiled list of activities and recorded in 15-min intervals over the period of one week. Thirteen radiographers who independently report radiographs participated across 6 locations in a busy multisite English National Health Service (NHS) Trust. **Results:** Radiographers reported the majority of the examinations during the study period ($n = 4512/5671$; 79.6%). The total number of coded activities recorded over the study period was 1527, equating to 380.5 relative hours. The majority of available time was spent reporting, including dictating and verifying the reports of colleagues or trainees, although 69.5% of reporting time was interrupted. Based upon the hours of reporting there was an average of 19.3 reports (patient episodes) produced per hour. Direct patient care tasks and support for staff in decision making were regularly documented. Supplementary tasks included administrative activity, amendments to rotas, preparing presentations and documenting incidents identified during reporting.

Conclusion: This study has demonstrated the breadth and complexity of the activities performed by advanced practice radiographers. The findings confirm their role in supporting service delivery beyond image interpretation.

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Introduction

Imaging continues to undergo rapid technical evolution¹ and services have had to evolve to keep pace with sustained annual increases in demand.² Although image acquisition strategies have delivered capacity growth, reporting remains a challenge³ and as a result new ways of working have developed at a local and national level. Radiographers have contributed to the reporting of radiographs for over 20 years in the United Kingdom (UK). This responsibility has been incorporated into new clinical roles, particularly at advanced and consultant practitioner levels. Although it is recognised that there is variation in radiographer reporting practices,^{4,5} there is little evidence of how this

contribution to service delivery impacts on patient outcomes and staff experience beyond direct role substitution.⁶

Historically, radiologist activity has been crudely assessed by measuring the number of images interpreted across imaging modalities. However, this does not take into account the proportion of time taken up by other activities which are harder to quantify, such as multidisciplinary meetings, advising clinicians and vetting or protocolling imaging procedures.^{7,8} Further, it is unclear whether radiographers have adopted some of the wider activities, or whether these remain with the radiology community, thereby increasing pressure on medical practitioners.

This study aimed to evidence the role that advanced (and consultant) practitioner radiographers play in service delivery and the impact this has on patients and staff, both within radiology and the wider healthcare setting. The objective was to collate the range of activities radiographers undertake through a standardised diary template and use these to quantify their contribution.

* Corresponding author. Fax: +44 1924 541608.

E-mail address: bev.snaith@midyorks.nhs.uk (B. Snaith).

Study setting

The study was based in a large English National Health Service (NHS) Trust spanning 3 acute hospital sites with a catchment area of 540,000 patients and 1116 beds. Of the 13 (12.6 whole time equivalent [WTE]) radiographers currently employed to report musculoskeletal (plain film) radiographs, 8 also interpret visceral (chest and abdomen) examinations. Radiographers provide 7-day cover with an average of 4 reporters available 9–5 Monday to Friday across the 3 sites. In addition, at least one radiographer is rostered to each evening and weekend with the ability to provide immediate reporting on demand across the organisation at a centralised location. In total 7.6 WTE is committed to reporting, with 11 individuals employed as advanced radiographer practitioners and the remaining 2 in consultant radiographer roles. Independent reporting experience ranges from 0.5 to 20 years. In addition to the four tiers of radiographic roles, the Trust employs 28 consultant radiologists and has up to 10 radiology speciality trainees on placement at any one time.

Over the last 10 years there has been a co-ordinated approach to workforce planning and service delivery, with 3 members of the team externally recruited with an existing reporting qualification to supplement the existing staff base. This strategy has established a team of advanced and consultant practitioners who provide the majority of the Trust's radiographic reporting. In 2015 the team authored 140,517 definitive reports across 3 acute hospitals, out of a total of 205,320 radiography attendances (events). The service operates both immediate (hot) and delayed (cold) reporting, using voice recognition. Co-ordinated availability at fixed workstation locations provides advice to radiographer and clinical colleagues as well as each other. Anecdotally the individuals are undertaking a broad range of support activities in addition to their interpretive role. There is however no data to confirm their contribution, in this context, to wider service delivery or demonstrate them to be working at an advanced level.

The cost of the radiographer reporting service has been calculated based on 2015/16 Agenda for Change salary scales (Table 1).⁹ Unsocial hours pay enhancements have been applied at the top increment of band 7 for 7.5 h shifts on both Saturdays and Sundays across the year. The clinical time of the advanced practitioners has been excluded as this is a budgeted activity and would be required in the absence of a reporting service. However, it is recognised that this incurs additional cost as a result of the differential pay between band 6 and 7, therefore this has been included as a cost pressure. The whole time cost of the 2 consultant radiographers is incorporated in this economic evaluation, although both individuals also contribute to modality or whole service leadership as well as a small amount of clinical provision in other modalities.¹⁰ Importantly, the income associated with the consultant role around research and education has not been factored into this assessment. The non-clinical contribution of advanced practitioners to broader service objectives has also not been considered, this includes a formal mentorship programme, protocol management, audit and research; all of which are expectations of the role.

These figures compare to a potential outsourcing cost of £702,585.00 (based on £5 per event) or the requirement for an additional 6.5 WTE consultant radiologists (8.5 direct clinical care sessions and the local standard of 60 events reported per session). Based upon 2015 reporting activity, the cost per case was £3.07, which includes radiographer study leave, annual leave and sickness.

Method

The study was a prospective exploratory study using interval sampling of activities undertaken when individuals were rostered

to report. Based upon a literature review and informed by local job descriptions, a generic list of expected activities was compiled. These were given a numerical code and grouped by theme (domain). A pilot study was conducted over repeated hour increments at a single location by 3 radiographers. This led to minor changes to the activity coding resulting in a final version of the data coding list (Table 2).

A data collection tool previously validated by Oddsdóttir and Sveinsdóttir¹¹ was utilised to collect activity information (Fig. 1). This consisted of 15-min interval sampling with a maximum of 4 activities per time block. Additional free text comments to explain activities could be provided. The same diary template was used for data collection at each reporting location (workstation) regardless of the number of individual staff involved in service provision. The diary was completed over a consecutive 7-day period in May 2016.

The coded activity list and 7 copies of the data collection tool (one for each day) were provided at each reporting workstation used by a radiographer across the 3 hospital sites. These were dated to ensure a new template was completed each 24-h. The workstation sample comprises the reporting 'desks', where participant radiographers were rostered. A single central desk was used for extended day and weekend reporting provision (workstation A). In addition, 3 workstations are used routinely during the working week (workstations B, C and E). At 2 of the hospitals a workstation provided overflow when additional capacity was available beyond the expected single radiographer (workstations D and F).

No change to working practice was employed during the period of the study. Supplementary to activity diary data, the total volume of primary reports authored during the study period was extracted from the radiology information system (RIS).

Activity data points were transcribed into an Excel database (Microsoft Corporation, USA) to evaluate workloads and allow descriptive analysis. Further statistical analysis was performed using the online Social Science calculator (www.socscistatistics.com). The total hours of reporter availability were calculated, as well as the coded activities and their respective domain. As the participants could record multiple consecutive activities (up to 4) in each period, the actual time spent on each is not determined but is recorded as 15 min. In line with Oddsdóttir and Sveinsdóttir¹¹ the activities are described in terms of 'relative time' with the emphasis being on identifying diversity and multitasking rather than the actual time involved.

The study was a self-recorded observation of current practice, with no change in patient care or role; therefore was considered service evaluation and did not require ethical approval.

Results

Over seven days of data collection, a total of 4817 patient events, comprising 5671 separate examinations, were reported. Of these, the majority were authored by a radiographer (Table 3).

Visceral examinations comprised 43.9% (n = 2489/5671) of the studies reported. Visceral examinations comprised 36.0%

Table 1
An evaluation of 2015 radiographer reporting costs.

Detail	Cost
Advanced practitioner salaries (minus 40% image acquisition role)	£257,224.79
Additional cost of clinical role (difference between band 6 and 7)	£29,709.44
Weekend unsocial hours enhancement	£7584.46
2WTE Consultant practitioners	£137,476.80
Total cost	£431,995.49

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