

# **Radiographer reporting of trauma images: evaluation of practice in the United Kingdom**

## **Introduction**

The formal reporting of trauma radiographs by radiographers is an established role development in the United Kingdom (UK) [1]. Introduced in the mid 1990's and supported by locally developed education programmes, radiographer reporting was initially limited in scope. However, changes in service demands and work force capacity resulted in a rapid increase in both the numbers of reporting radiographers and the scope of reporting practice. As a result, in many hospitals, radiographers now share the task of reporting radiographic images with radiologists [2, 3].

The performance of reporting radiographers has been widely examined in terms of ability to accurately recognise, describe and diagnose pathology [4, 5, 6]. However, little published literature has considered the implementation of reporting practice in the clinical setting or the contribution radiographer reporting is making to patient care, despite this being identified as a primary objective of skills mix initiatives [7, 8].

A survey of radiographer role extension in 2004 by Price and Le Masurier [5] found that radiographer reporting of musculoskeletal radiographs was undertaken in 53% of the 177 responding UK hospital Trusts [9]. However, closer examination of the extent of radiographer reporting in clinical practice identified that image reporting equated to only 172 whole time equivalent (WTE) radiographers, less than 1% of the total number of qualified radiographers in the UK [10]. This limitation has been associated with a restriction in the clinical reporting time made available to radiographers [11], possibly as a result of radiographer reporting practices emulating the traditional 'cold' or retrospective reporting service provided by radiologists. However, with respect to trauma services, 'cold' reporting is not recognised as best practice and instead, the 'gold standard' is the availability of a radiological report at the time of patient attendance (a 'hot' report) [12].

This study evaluates the contribution of radiographers to the trauma reporting service across the UK and examines regional differences in radiographer reporting implementation including innovations in reporting practice, in particular those relating to 'hot' reporting. It builds upon previously reported findings related to the role of the radiographer in trauma abnormality detection [13].

## **Method**

Following a critical review of the literature, a cross-sectional survey was undertaken using a postal questionnaire as the data collection tool. A pilot study was undertaken to ensure questionnaire accuracy, appropriateness and relevance. The questionnaire was updated following feedback from the pilot study and in February 2007, was distributed to every hospital in the UK (including Northern Ireland, Channel Islands and the Isle of Man) that offered both radiography and trauma services (emergency department (ED) or minor injuries unit (MIU)). The questionnaire return date was determined to be within 4 weeks of anticipated receipt. A total of 456 hospital sites were identified from the British Association of Emergency Medicine (BAEM) online directory [14]. Data analysis was undertaken using SPSS version 14.0 (SPSS Inc., Chicago, IL) and STATA version 9.0 (Stata Corporation, College Station, TX).

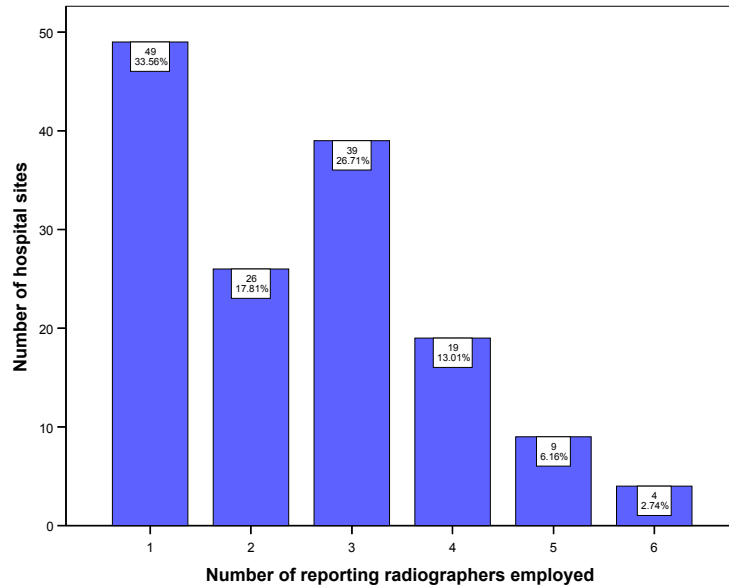
## **Results**

A total of 306 (n=306/456; 67.1%) responses were received within the specified response time frame. Approximately 2/3<sup>rd</sup> responses were from hospitals with an ED (n=203/306; 66.3%) and 1/3<sup>rd</sup> from hospitals with a MIU (n=103/306; 33.7%). A greater proportion of responses were received from hospitals that had an ED rather than a MIU ( $z=1.99$ ;  $p=0.047$ ).

56.9% (n=174/306) of hospital sites employed radiographers who contributed to the trauma reporting service. Reporting radiographers were more likely to be employed within sites that had an ED (n=142/203; 70.0%) than a MIU (n=32/103; 31.1%). The number of reporting radiographers employed was indicated by 146 hospitals (n=146/174; 83.9%) and ranged between 1 and 6

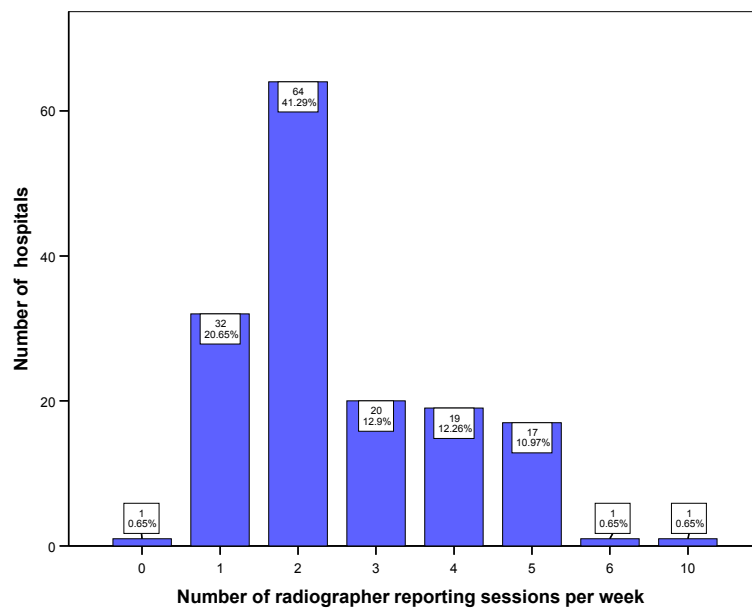
radiographers (see figure 1) at each site, totalling 363 reporting radiographers.

Figure 1: Number of reporting radiographers employed per hospital (n=146)



The number of weekly reporting sessions (half-day) undertaken by each radiographers was indicated by 155 respondents (155/174; 89.1%) and varied between 1 and 10 sessions (see figure 2).

Figure 2: Number radiographer reporting sessions per radiographer per week (n=155)



The employment of reporting radiographers varied by UK country and region (see Table 1), one hospital employed reporting radiographers but data related to the country and region was missing.

Table 1: Employment of reporting radiographers by UK region

Country / Region	Hospital responses by region No (%)	Responding sites employing reporting radiographers No (%)
<b>England</b>	<b>236/347 (68.0)</b>	<b>150/236 (63.6)</b>
North East	22/33 (66.6)	11 (50.0)
North West	24/33 (72.7)	19 (79.2)
Yorkshire & the Humber	25/32 (78.1)	21 (84.0)
East Midlands	15/25 (60.0)	8 (53.3)
West Midlands	26/35 (74.3)	16 (61.5)
East of England	24/27 (88.9)	18 (75.0)
London	23/39 (59.0)	16 (69.6)
South East Coast	24/37 (64.9)	17 (70.8)
South Central	12/20 (60.0)	8 (66.7)
South West	42/66 (63.6)	15 (35.7)
<b>Scotland</b>	<b>30/42 (71.4)</b>	<b>5/30 (16.7)</b>
Highlands	7/7 (100)	0 (0)
Grampian	3/3 (100)	1 (33.3)
Shetland	1/1 (100)	1 (100)
Tayside	2/3 (66.6)	0 (0)
Fife	0/4 (0)	
Lothian	1/3 (33.3)	0 (0)
Borders	0/1 (0)	
Dumfries and Galloway	0/2 (0)	
Ayrshire and Arran	3/3 (100)	0 (0)
Lanarkshire	2/3 (66.6)	2 (100)
Glasgow	8/9 (8.9)	1 (12.5)
Forth Valley	3/3 (100)	0 (0)
<b>Wales</b>	<b>25/45 (55.6)</b>	<b>13/30 (43.3)</b>
Mid and West Wales	12/23 (52.2)	6 (50.0)
North Wales	8/15 (53.3)	4 (50.0)
South East Wales	5/7 (71.4)	3 (60.0)
<b>Northern Ireland</b>	<b>10/18(55.6)</b>	<b>5/10 (50.0)</b>
<b>Channel Islands</b>	<b>3/3(100)</b>	<b>1/3 (33.3)</b>
<b>Isle of Man</b>	<b>1/1(100)</b>	<b>0/1 (0.0)</b>

A 'hot' reporting service for trauma patients operated at 58 responding hospitals (n=58/306; 19.0%). This service was offered routinely at 34 hospitals (n=34/58; 58.6%), occasionally at 12 hospitals (n=12/58; 20.7%) and when required at the remaining 11 hospitals (n=1/58; 19.0%). As 'hot' reporting of trauma images is considered to be the 'gold standard', regional analysis of

service implementation was once again undertaken to establish any variation or natural clustering of service provision (see Table 2).

Table 2: Routine 'hot' reporting service provision by UK region

Country / Region	Number of sites offering routine 'hot' reporting (%)	Number of sites radiographers lead and run 'hot reporting service (%)
<b>England</b>	<b>29/236 (12.3)</b>	<b>22/236 (9.3)</b>
North East	4/22 (18.2)	4/22 (18.2)
North West	3/24 (12.5)	3/24 (12.5)
Yorkshire & the Humber	7/25 (28.0)	6/25 (24.0)
East Midlands	3/15 (20.0)	2/15 (13.)
West Midlands	1/26 (3.8)	1/26 (3.8)
East of England	1/24 (4.2)	1/24 (4.2)
London	4/23 (17.4)	1/23 (4.3)
South East Coast	3/24 (12.5)	2/24 (6.3)
South Central	2/12 (16.7)	2/12 (16.7)
South West	1/42 (2.3)	0/42 (0)
<b>Scotland</b>	<b>0/30 (0)</b>	<b>0/30 (0)</b>
<b>Wales</b>	<b>3/25 (12)</b>	<b>1/25 (4.0)</b>
Mid and West Wales	2/12 (16.7)	1/12 (8.3)
North Wales	1/8 (12.5)	0/8 (0.0)
South East Wales	0/5 (0)	0/5 (0.0)
<b>Northern Ireland</b>	<b>1/10 (10.0)</b>	<b>0/10 (0)</b>
<b>Channel Islands</b>	<b>0/3 (0)</b>	<b>0/3 (0)</b>
<b>Isle of Man</b>	<b>0/1 (0)</b>	<b>0/1 (0)</b>

Of the sites offering hot reporting, 47 (n=47/58; 81.0%) employed reporting radiographers. At 23 sites (n=23/58; 39.7%) radiographers lead the 'hot' reporting service and at a further 12 sites (n=12/58; 25.5%), radiographers contributed to 'hot' reporting sessions. No radiographer involvement in the 'hot' reporting service was reported at 7 sites (n=7/58; 14.9%). Four sites purporting to provide a 'hot' reporting service did not provide details as to level of radiographer involvement.

## Discussion

The number of reporting radiographers employed within UK hospitals is increasing and this trend is likely to continue [9, 15]. There is a growing expectation by persons entering the radiographic profession that image interpretation will comprise some part of the radiographer's role. Indeed, the

'Learndirect' career website describes the profession of diagnostic radiography both as *producing and interpreting high-quality images* [16]. The evidence of this study also suggests that the employment of reporting radiographers is no longer restricted to specific English regions. Instead, the employment of reporting radiographers is widespread across England with hospitals in Scotland, Wales and Northern Ireland also beginning to diversify their image reporting workforce through the employment of radiographers to report trauma radiographs.

The success of radiographer contribution to radiographic review and image interpretation in the trauma environment is well documented [3,17,16] and it is in this clinical area that radiographer reporting has had the biggest impact [1]. The formal radiological review of trauma radiographs, including the definitive reporting of image findings, serves a specific purpose – to identify abnormalities missed by the emergency clinician at initial interpretation<sup>3</sup>. However, in this study only 19.0% of hospital sites (n=58/306) operated a 'hot' reporting service to provide a radiological report at the time of patient attendance despite this being seen as the ideal or 'gold standard' for radiology departments. This figure has increased from the 12.1% of UK departments offering a 'hot' reporting service in 2002 [19] but the rate at which service change is occurring appears to be slow. This may in some ways may be explained by the crisis in imaging workforce numbers experienced over the last decade that has challenged service development [11,20]. However, evaluation of the average contribution to image reporting made by radiographers per week (see Results: figure 2) has identified that at the majority of hospitals (n=96/155; 61.9%), radiographers only contribute to image reporting for a period of 1 day a week (or less). This is likely to be as a direct consequence of limited image reporting stations and the persistence of a 'cold' reporting service. However, this evidence also suggests that staff vacancies are no longer a critical issue. Indeed, it may be necessary to consider alternative or innovative ways of utilising the skills of reporting radiographers to ensure that their skills are not eroded through limited opportunities to report images in the clinical setting. Consequently, within the context of trauma services, perhaps the time has come to consider carefully the implementation of radiographer 'hot' reporting services.

There is some evidence that radiographers have already stepped up to the challenge of developing 'hot' reporting services to respond to the needs of the ED [21, 22] and meet the service aspirations of the radiography professional body (College of Radiographers)[1] and the Audit Commission[11]. Indeed this study has identified that where reporting radiographers are employed, a large number of 'hot' reporting services for trauma (n=23/47; 48.9%) are directed and operated by radiographers with a significant number of other 'hot' reporting systems having radiographer contribution (n=12/47; 25.5%). However, the extent of these 'hot' reporting services, including restrictions on the type of radiographic examinations reported and service operation times, are currently unknown. Further, no study has yet considered the impact of 'hot' reporting on the patient's pathway and trauma service delivery. Consequently, while 'hot' reporting may be promoted as the service ideal, work is needed to evaluate such innovations in order to evidence its implementation.

## **Conclusion**

This study has provided insight into current levels of employment of reporting radiographers in the UK with respect to trauma imaging and the contribution they are making to the reporting service. While the evidence confirms the increasing number of hospitals employing reporting radiographers, it also suggests that they currently make a limited contribution to the reporting service and new and innovative ways of working need to be developed to ensure that their skills are appropriately utilised. This study identified a small number of hospitals where this was being addressed with the introduction of radiographer 'hot' reporting services. However, no evaluation of the success of such services in terms of care delivery targets has been identified and further work is required to evidence the clinical impact of radiographer 'hot' reporting practices on trauma service delivery.

## References

1. College of Radiographers. Medical image interpretation and clinical reporting by non-radiologists. London, UK: College of Radiographers, 2005.
2. Paterson AM, Price RC, Thomas A, Nuttall L. Reporting by radiographers: a policy and practice guide. *Radiography*, 2004; 10: 205-10.
3. Bengner JR, Lyburn ID. What is the effect of reporting all emergency department radiographs? *Emergency Medicine Journal* 2003; 20: 40-3.
4. Robinson PJA, Culpan G, Wiggins M. Interpretation of selected accident and emergency radiographic examinations by radiographers: a review of 11000 cases. *British Journal of Radiology* 1999; 72: 546-51.
5. Piper KJ, Paterson AM, Godfrey RC. Accuracy of radiographers' reports in the interpretation of radiographic examinations of the skeletal system: A review of 6796 cases. *Radiography* 2005; 11(1): 27-34.
6. Brearley S, Scally A, Hahn S, Thomas N, Godfrey C, Coomarasamy A. Accuracy of radiographer plain film reporting in clinical practice: A meta-analysis *Clinical Radiology* 2005; 60(2): 232-41.
7. Royal College of Radiologists and Society and College of Radiographers Team working within clinical imaging: A contemporary view of skills mix. London, UK: Royal College of Radiologists; 2006.
8. Sibbald B, Shen J, McBride A. Changing the skill-mix of health care workforce. *Journal of Health Services Research & Policy* 2004; 9(1): 28-38.
9. Price RC, Le Masurier SB. Longitudinal changes in extended roles in radiography: A new perspective. *Radiography* 2007; 13(1): 18-29.
10. Society of Radiographers. Annual report London, UK: Society of Radiographers; 2004.

11. Brayley N. The need for radiographer reporting: an accident and emergency (A&E) perspective. *Radiography* 2000; 6:227-9.
12. Audit Commission. *Acute hospital portfolio: Radiology*. London, UK: Audit Commission; 2002.
13. Snaith BA and Hardy ML. Radiographer abnormality detection schemes in the trauma environment – An assessment of current practice. *Radiography* (under review).
14. BAEM directory. London: British Association of Emergency Medicine. [undated; cited 2007 Jan 13] Available from: <http://www.baemdirectory.com>
15. Price R. Radiographer reporting: origins, demise and revival of plain film reporting. *Radiography* 2001; 7: 105-17.
16. Radiographer. Learndirect. [Updated 2007 Jun 15; cited 2007 Jan 13] Available from: <http://www.learndirect-advice.co.uk/helpwithyourcareer/jobprofiles/profiles/profile444/>
17. Guly HR. Diagnostic errors in an emergency department. *Emergency Medicine Journal* 2001; 18:263-9.
18. Hallas P, Ellingsen T. Errors in fracture diagnoses in the emergency department – characteristics of patients and diurnal variation *Bio Med Central Emergency Medicine* 2006; 6(4): doi:10.1186/1471-227X-6-4 [cited 2007 May 20]. Available at: <http://www.biomedcentral.com/1471-227X/6/4>
19. Hardy M, Barrett C. Interpreting trauma radiographs. *Journal of Advanced Nursing* 2003; 44(1): 81-7.
20. Royal College of Radiologists Workforce in crisis. London, UK: Royal College of Radiologists; 2002

21. Jones H. The introduction of a radiographer-led A&E hot reporting service  
Synergy 2005; 6:16-8.
  
22. Snaith BA. Radiographer-led discharge in accident and emergency– the  
results of a pilot project. Radiography 2007; 13(1): 13-7.