

Radiographer interpretation of trauma radiographs: Issues for radiography education providers

Maryann Hardy ^{a,*}, Beverly Snaith ^b

^a Division of Radiography, School of Health Studies, University of Bradford, Trinity road, Bradford, West Yorkshire BD5 0BB, United Kingdom

^b Mid Yorkshire Hospitals NHS Trust, Radiology Department, Pinderfields General Hospital, Aberford Road, Wakefield WF1 4DG, United Kingdom

Received 27 July 2007; revised 24 September 2007; accepted 11 October 2007
Available online 21 February 2008

KEYWORDS

Education;
Radiography;
Image interpretation

Abstract *Background:* The role of radiographers with respect to image interpretation within clinical practice is well recognised. It is the expectation of the professional, regulatory and academic bodies that upon qualification, radiographers will possess image interpretation skills. Additionally, The College of Radiographers has asserted that its aspiration is for all radiographers to be able to provide an immediate written interpretation on skeletal trauma radiographs by 2010. This paper explores the readiness of radiography education programmes in the UK to deliver this expectation.

Method: A postal questionnaire was distributed to 25 Higher Education Institutions in the UK (including Northern Ireland) that provided pre-registration radiography education as identified from the Society & College of Radiographers register. Information was sought relating to the type of image interpretation education delivered at pre- and post-registration levels; the anatomical range of image interpretation education; and education delivery styles.

Results: A total of 19 responses ($n = 19/25$; 76.0%) were received. Image interpretation education was included as part of all radiographer pre-registration programmes and offered at post-registration level at 12 academic centres ($n = 12/19$; 63.2%). The anatomical areas and educational delivery methods varied across institutions.

Conclusion: Radiography education providers have embraced the need for image interpretation education within both pre- and post-registration radiography programmes. As a result, UK education programmes are able to meet the 2010 College of Radiographers aspiration.

© 2007 The College of Radiographers. Published by Elsevier Ltd. All rights reserved.

Introduction

The potential role for image interpretation within radiographic practice is well recognised.^{1–3} Over the last two decades radiographer abnormality detection schemes (RADS)

* Corresponding author. Tel.: +44 01274 236578.
E-mail address: m.l.hardy1@bradford.ac.uk (M. Hardy).

such as red dot, and latterly commenting, have become widespread.⁴⁻⁷ But alongside this, the contribution of radiographers to the formal reporting provision within NHS trusts has increased and a recent survey identified that radiographers are now employed to report trauma radiographs in almost 60% of hospital sites.⁸

The expectation of professional (College of Radiographers (CoR)), regulatory (Health Professionals Council (HPC)) and the academic (Quality Assurance Agency (QAA)) bodies is that on qualification, radiographers will possess image interpretation skills.^{1,9,10} Indeed, the CoR has asserted that its aspiration is for all radiographers to be able to provide an immediate written interpretation on skeletal trauma radiographs by 2010, a target that places significant expectations on pre-registration education.¹

Despite there being a wealth of publications examining radiographer image interpretation in clinical practice, little literature has explored the role of Higher Education Institutions (HEIs) in the development of these skills at either a pre- or post-registration level although a number of studies have examined the role of education in the development of radiographers to participate in RADS.¹¹⁻¹⁴ One of the few reviews of formal education took place in 1999, when Prime et al. undertook an analysis of the available postgraduate programmes in radiographic reporting.¹⁵ At this time only 6 HEIs were offering image interpretation courses and although the nature of each varied, all indicated they were responding to the needs of clinical departments.

Changes and developments in both pre- and post-registration radiography education are heavily influenced by service requirements and clinical expectations of new graduate competencies.¹⁶ However, as all radiography courses are expected to include educational components to satisfy the needs of clinical departments as well as meet the professional standards set by national educational and professional bodies (CoR, HPC and QAA), it is suggested that all radiography degree programmes in the UK are similar.¹⁶ Consequently, with respect to pre-registration Diagnostic Radiography education, it is not unreasonable to expect all programmes to include image interpretation to meet both clinical and professional body expectations.

This article presents a review of the current provision of image interpretation education within HEIs, at pre- and post-registration levels, exploring both continuing professional development (CPD) as well as formal postgraduate education.

Method

Following a critical review of the literature, a cross-sectional survey was undertaken using a postal questionnaire as the data collection tool. The questionnaire was designed to elicit factual information relating to the type of education delivered at pre- and post-registration levels to support radiographer participation in RADS and/or formal radiographic reporting. In particular, information was sought on the anatomical range of image interpretation education and education delivery styles adopted. The questionnaire adopted a closed question design and

respondents were encouraged to expand upon their answers using free text space provided.

A pilot study was undertaken to ensure the accuracy, appropriateness and relevance of the questionnaire and feedback from the pilot study informed improvements in the questionnaire design. In February 2007, the final questionnaire was distributed to 25 Higher Education Institutions (HEI's) in the UK identified from the Society & College of Radiographers (SCoR) register¹⁷ as providing pre-registration radiography education. This HEI list was cross checked against the SCoR register of post-registration courses¹⁸ to ensure all sites offering image interpretation education at post-registration level were included.

The questionnaire return date was determined to be within 4 weeks of distribution. 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 19 responses ($n = 19/25$; 76.0%) were received within the specified response time frame. Image interpretation education was included as part of all radiographer pre-registration programmes and offered at post-registration level at 12 HEI's ($n = 12/19$; 63.2%).

Pre-registration education

In response to defining how image interpretation education was delivered within pre-registration courses, all respondents indicated that it was included within planned academic lectures or tutorials and at 10 sites ($n = 10/19$; 52.6%), this was further supported by formal lectures or tutorials in the clinical environment (see Fig. 1). Image

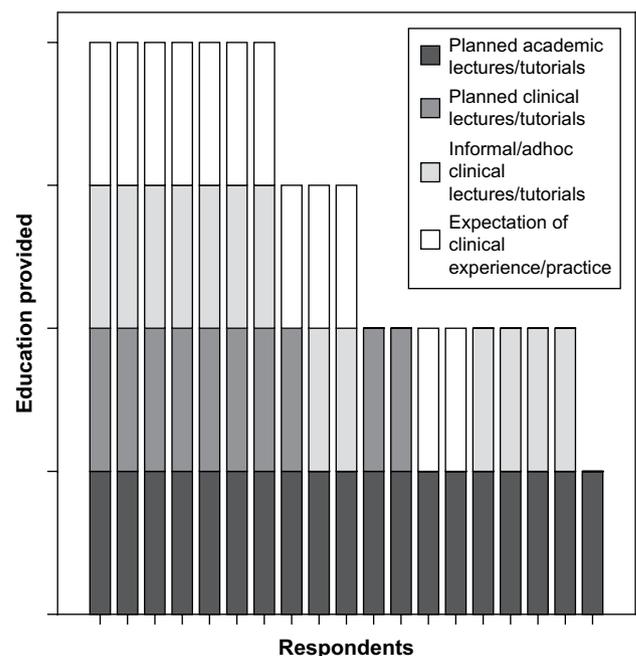


Figure 1 Type of pre-registration image interpretation education provided.

interpretation was an expected clinical learning outcome at 12 sites ($n = 12/19$; 63.2%).

The majority of HEI's ($n = 11/19$; 57.9%) delivered image interpretation education as part of discrete modules within pre-registration programmes. All sites included image interpretation of the appendicular skeleton, 18 sites the axial skeleton ($n = 18/19$; 94.7%), 16 sites the chest ($n = 16/19$; 84.2%) and 12 sites the abdomen ($n = 12/29$; 63.2%). Formal assessment of image interpretation skills using an Objective Structured Clinical Examination (OSCE) was undertaken at all sites. At 8 sites ($n = 8/19$; 42.1%), image interpretation skills were further assessed using other academic assessment strategies (e.g. assignments). No pre-registration radiography course awarded a certificate of competence to participate in a RADS or formally report radiographs as an outcome of graduation or academic success in image interpretation modules.

Post-registration education

Post-registration image interpretation education was delivered at 12 sites ($n = 12/19$; 63.2%). The majority of these offered a postgraduate award pathway ($n = 11/12$; 91.7%) and/or independent postgraduate modules ($n = 7/12$; 58.3%). Six sites ($n = 6/12$; 50.0%) offered non-credit rated continuing professional development (CPD) short courses but no site offered distance learning image interpretation education (see Fig. 2).

All 12 sites offered image interpretation of the appendicular skeleton education at post-registration level, 11 sites offered axial skeleton ($n = 11/12$; 91.7%), 9 sites the chest ($n = 9/12$; 75.0%) and 4 sites the abdomen ($n = 4/12$; 33.3%). Most HEI's offered more than one education delivery choice (see Fig. 3).

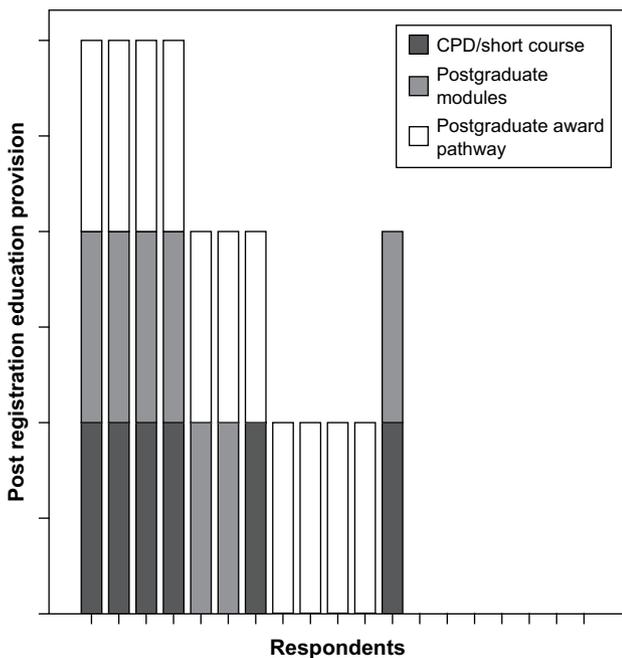


Figure 2 Type of post-registration image interpretation education provided.

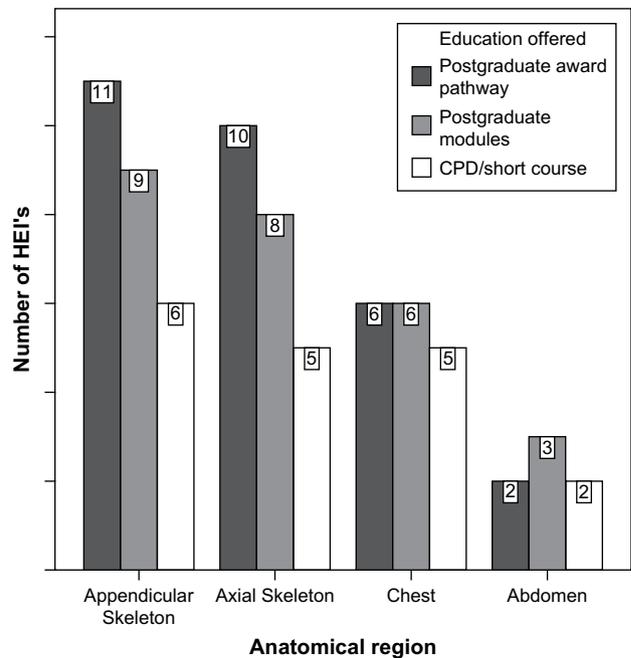


Figure 3 Post-registration image interpretation education delivery styles.

A certificate of competence to participate in a RADS was awarded following completion of a CPD/short course at 1 site ($n = 1/6$; 16.7%) and following completion of a post-graduate image interpretation award pathway at 2 sites ($n = 2/11$; 18.2%). A certificate of competence to formally report radiographs was awarded following completion of a postgraduate image interpretation award pathway at 3 HEI's ($n = 3/11$; 27.3%).

Discussion

Despite the small number of HEIs involved in radiography education in the UK, a high response rate was achieved, providing a reasonable cross section of centres from throughout the 4 UK countries.

It appears that in response to the stipulated requirements of the CoR, HPC and QAA all HEIs do include image interpretation in the pre-registration curriculum, though when and how this is taught varies. The main variation between sites is related to the integration of image interpretation education within clinical placement. Although further detail was not sought, this may relate to the confidence on the part of the supervising radiographers, or a lack of integration of clinical and academic skills. Alternatively this may be now such an embedded part of radiography clinical practice that its inclusion as a separate entity may not be appreciated.

It is clear that the main focus of pre-registration image interpretation education is on skeletal anatomy, with all centres including the appendicular and most the axial skeleton. This probably replicates the developments in practice with the scope of RADS historically encompassing only skeletal radiographs.¹⁹ This may also mirror post-registration image interpretation development and expertise with 63.2% of centres

offering skeletal radiographic reporting pathway/modules with half of these also providing CPD image interpretation programmes. Pre-registration image interpretation education related to the chest and abdomen was more limited, despite the chest radiograph being the most commonly performed radiographic examination in clinical practice. Indeed in a study by Hughes et al. radiographers identified that interpretation of chest radiographs was not adequately covered in standard teaching despite the fact that in clinical practice the radiographer is often asked to comment on chest radiographs, particularly those from the Emergency Department (ED).²⁰ Sonnex concurs with this suggesting that radiographer role expansion and education in chest image interpretation has suffered from too little, too late.²¹ A survey undertaken in 2004 identified that only 4% of Hospital Trusts employed radiographers to report chest radiographs compared to 53% employing radiographers to report musculoskeletal examinations.²²

At post-registration level, the number of HEIs offering radiographer reporting courses has doubled in the 11 years since the first review of the curricula.¹⁵ However, at the time of this survey, no HEI provided an option for distance learning image interpretation education despite the potential of online learning to widen participation avenues, particularly where issues of accessibility exist or limited departmental support is available.²³ Further, it has been suggested that radiographic pathology would be an appropriate topic for distance learning online delivery²³ and would meet both formal education and CPD needs.²⁴ Yet the adoption of virtual learning environments and distance learning education delivery strategies remains varied and suggested reasons for this include the time required for academic staff to convert teaching materials and a lack of ability to effectively use virtual learning environments.

Despite earlier publications suggesting that clinical competence in radiographic image interpretation could be measured through the use of formative log books and summative assessment,¹⁵ no HEI within this study provided a certificate of competency in reporting upon successful completion of the educational programme/pathway. Further, only 3 institutions provided a certificate of competency to 'red dot' or comment upon a radiographic image following successful completion of a course of post-registration study. No HEI issued a certificate of competence to participate in a RADS to students completing pre-registration degree courses. As a result, the responsibility for determining the standard for radiographer image interpretation as a first post competency appears to be with the employing clinical department.¹⁵ However the results of a recent survey suggest that assessment of the basic competence of radiographers to participate in RADS is rarely undertaken and audit of image interpretation skills in clinical practice limited.⁷ Reassuringly audit of competence with respect to formal radiographer reporting is more prevalent.²⁵

Conclusion

HEIs have embraced the need for radiographer image interpretation education within both pre- and post-registration radiography programmes. However, at pre-registration level, the breadth of content is varied. It is uncertain from the data whether integration of clinical and academic

learning outcomes has taken place to ensure qualifying students have the appropriate image interpretation skills to meet the needs of service delivery in terms of participation in RADS. Similarly, at post-registration, subject areas and levels offered (CPD, module, programme, pathway) are varied with few HEIs offering the full range of subjects and levels or providing opportunities for distance learning. It appears then, that although further development of education programmes in image interpretation at pre- and post-registration levels are possible, HEI programmes are able to provide education appropriate to meet the CoR aspiration for all radiographers to be able to make an initial interpretation on a musculoskeletal trauma images by 2010.

Acknowledgements

This study was funded by the College of Radiographers research award.

References

1. College of Radiographers. *Medical image interpretation & clinical reporting by non-radiologists: the role of the radiographer*. London: College of Radiographers; 2006.
2. Price R. Radiographer reporting: origins, demise and revival of plain film reporting. *Radiography* 2001;7:105–17.
3. 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.
4. Berman L, de Lacey G, Twomey E, Twomey B, Welch T, Eban R. Reducing errors in the accident department: a simple method using radiographers. *Br Med J* 1985;290:421–2.
5. Brealey S, Scally A, Hahn S, Thomas N, Godfrey C, Crane S. Accuracy of radiographers red dot or triage of accident and emergency radiographs in clinical practice: a systematic review. *Clin Radiol* 2006;61:604–15.
6. Snaith BA. Are Trusts replacing the red dot? *Br J Radiol UKRC* 2004;(Suppl.):46–7.
7. Snaith B, Hardy M. Radiographer abnormality detection schemes in the trauma environment – an assessment of current practice. *Radiography* 2008;14:277–87.
8. Hardy M, Snaith B. 2007 College of Radiographers funded research project, unpublished data.
9. Health Professions Council. *Standards for proficiency: radiographers*. London: Health Professions Council; 2003.
10. Quality Assurance Agency. Benchmark statements: radiography 2001 [online]. Available from, <http://www.qaa.ac.uk/academicinfrastructure/benchmark/health/radio.pdf> [accessed 3 January 2007].
11. McConnell JR, Webster AJ. Improving radiographer highlighting of trauma films in accident and emergency departments with a short course of study – an evaluation. *Br J Radiol* 2000;73:608–12.
12. Hargreaves J, Mackay S. The accuracy of the red dot system: can it improve with training? *Radiography* 2003;9(4):283–9.
13. Mackay S. The impact of a short course of study on the performance of radiographers when highlighting fractures on trauma radiographs: "the Red Dot System". *Br J Radiol* 2006;79:468–72.
14. Hardy M, Culpan G. Accident and emergency radiography: a comparison of radiographer commenting and 'red dotting'. *Radiography* 2007;13(1):65–71.
15. Prime N, Paterson AM, Henderson PI. The development of a curriculum – a case study of six centres providing courses in radiographic reporting. *Radiography* 1999;5:63–70.

16. Pratt S, Adams C. How to create a degree course in radiography: a recipe. *Radiography* 2003;9:317–22.
17. Society and College of Radiographers. *Directory of pre-registration courses*.
18. Society and College of Radiographers. *Directory of post-registration courses*.
19. Chan O, editor. *ABC of emergency radiology*. London: Blacwell Publishing; 2007.
20. Hughes H, Hughes K, Hamill R. A study to evaluate the introduction of a pattern recognition technique for chest radiographs by radiographers. *Radiography* 1996;2:263–88.
21. Sonnex EP, Coulden RAR. Br J Radiol UKRC 2007;(Suppl.):29.
22. Price RC, Le Masurier SB. Longitudinal changes in extended roles in radiography: a new perspective. *Radiography* 2007;13(1):18–29.
23. Rosenkoetter LE. Moving toward online courses. *Radiography* 2007;13(4):271–5.
24. Henwood SM, Huggett SM. Radiographic CPD requirements – a regional study. *Radiography* 1999;5:3–10.
25. Jones HC, Manning D. A survey to assess audit mechanisms practised by skeletal reporting radiographers. *Radiography* 2008;14:201–5 [accessed 16 July 2007].