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## COMMENTARY

### Radiographer reporting

Nick Woznitza, BSc, PgDip, PgCert<sup>1,2</sup>

<sup>1</sup>Radiology Department, Homerton University Hospital, London, United Kingdom

<sup>2</sup>Allied Health Department, Canterbury Christ Church University, Kent, United Kingdom

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Radiographers worldwide are integral to the diagnostic pathway and are optimally placed to provide expert comment on radiographs. By nature, the radiographer is the first health care professional to view each diagnostic image, which has been acquired by a focus on the patient. Radiographers are in a unique position to communicate their professional observations directly with the treating clinician in a timely manner and thereby have a significant influence on patient care. Currently, advanced practitioner roles, which incorporate radiographer reporting, are limited to the United Kingdom (UK).<sup>1</sup> The changing nature of health care worldwide has seen several countries including Canada,<sup>2</sup> Australia,<sup>3</sup> Norway<sup>4</sup> and Denmark<sup>5</sup> develop models of advanced radiographer practice which includes definitive clinical reporting.

Swinburne first raised the possibility of trained radiographers expanding their role to incorporate preliminary image interpretation,<sup>6</sup> although the pioneering work of Berman et al.<sup>7</sup> is seen as the origin of radiographer preliminary image interpretation. The proposed system of work required radiographers to highlight abnormal trauma skeletal radiographs by placing a 'red dot' on the image, which indicated to the casualty officer the possible presence of significant pathology. This method has been shown to reduce diagnostic errors in the Emergency Department.<sup>7</sup> In 2006, the Society and College of Radiographers, while recognising the benefits of the 'red dot' system of preliminary radiograph interpretation, also identified several weaknesses, which includes the ambiguity of an absence of a 'red dot'.<sup>8</sup> Preliminary clinical evaluation (PCE) builds on abnormality detection by radiographers, as PCE requires a concise written statement which localises and describes the pertinent findings.<sup>1</sup> The provision of a written interpretation directs the treating clinician to the area(s) of concern and removes many of the ambiguity of the 'red dot' system, such as cases with multiple abnormalities, incorrect interpretation of abnormalities on an abnormal image and

communication of uncertainty in the radiographer decision.<sup>1,9</sup> A survey undertaken of UK radiology departments in 2008 found a significant majority provide a system of radiographer abnormality detection for skeletal trauma imaging; most still use the 'red dot', while some provide a PCE or a hybrid system.<sup>10</sup>

In parallel to this expansion of radiographer practice, the role of the advanced practitioner has been developed in the United Kingdom which incorporates the provision of definitive clinical reports by appropriately trained radiographers.<sup>1</sup> The performance of radiographers in interpreting skeletal radiographs at the end of an accredited postgraduate training program was promising with high levels of sensitivity (91.6–96.7%) and specificity (92.1–94.0%) reported.<sup>11</sup> A large multi-centre clinical evaluation, consisting of 7179 cases conducted across four sites in the United Kingdom, demonstrated very high levels of accuracy, sensitivity and specificity, 99.1%, 97.6% and 99.3%, respectively, for skeletal trauma reports produced by trained reporting radiographers.<sup>12</sup> A subsequent meta-analysis conducted by Brealey et al.<sup>13</sup> examined the performance of radiographer reporting for 28,900 plain imaging examinations and provided the definitive evidence that trained reporting radiographers can provide clinical reports on skeletal radiographs at a level comparable to consultant radiologists.

Trained radiographers now provide definitive clinical reports on skeletal radiographs throughout the U.K., with 59 (41%) of 143 departments providing this service in 2012.<sup>14</sup> In response to evolving service needs, radiographer reporting has expanded in scope beyond skeletal trauma. There is a growing body of evidence that supports trained radiographers who can provide definitive clinical reports for chest radiographs,<sup>15,16</sup> magnetic resonance imaging (MRI) lumbar spine and knee examinations,<sup>17</sup> and mammograms.<sup>18</sup> Multidisciplinary team working, which incorporates radiographer reporting, has been highlighted in recent a

joint publication by the Royal College of Radiologists and Society and College of Radiographers as one method to deliver an effective, efficient and patient focused radiology service.<sup>19</sup>

The interesting article by Neep et al.<sup>20</sup> explores the confidence of a cohort of Australian radiographers in the provision of both radiographer abnormality detection (red dot) and PCE (radiographer comment). Based on the results of a cross-sectional survey, they note that radiographers report high confidence when participating in abnormality detection systems, but lower confidence and perceived accuracy is suggested for PCEs. The authors of the study hypothesise that this may be due to the prior educational support and experience of the radiographers.

The results of Neep et al.<sup>20</sup> are similar to the findings of Coleman and Piper<sup>21</sup> who found that radiographers reported lower confidence when interpreting a bank of trauma radiographs when compared to emergency nurse practitioners (ENP) and junior medical staff. Although the radiographers reported lower confidence, the radiographers had the highest average score (28.5/40) for the image bank of all professional groups, significantly higher than the ENPs (21/40;  $P < 0.01$ ) and junior casualty medical staff (21.5/40;  $P = 0.02$ ).<sup>21</sup> The radiographers were also the only group whose confidence correlated with accuracy ( $r = 0.51$ ;  $P = 0.02$ ).<sup>18</sup> Lower radiographer confidence in the provision of PCEs was identified in the analysis conducted at a multi-site NHS Trust, with education and training highlighted as potential barriers to improved confidence.<sup>22</sup> Uptake of PCE by radiology departments in the United Kingdom remains patchy, with authors speculating whether definitive clinical reporting by radiographers has helped or hindered this progression.<sup>10</sup>

Education and training, which incorporates tutorials and feedback, improves radiographer image interpretation performance.<sup>23</sup> This is true for both definitive clinical reporting<sup>13</sup> and preliminary radiographer interpretations.<sup>9</sup> The magnitude of improvement has been shown to be greater for radiographer abnormality detection when compared to PCE,<sup>9,24</sup> but some of this difference may be due to the inherent ambiguity in the red dot/abnormality detection system.

The College of Radiographers, in conjunction with the U.K. regulatory body (Health and Care Professions Council), have mandated that image interpretation training is included as part of pre-registration.<sup>1</sup> Online resources, which include adult and paediatric skeletal and adult chest radiograph interpretation, have been developed at a national level to support undergraduate students and practitioners in the provision of radiographer PCE.<sup>25</sup> A recent report has highlighted

examples of Australian trained radiographers who have taken up advanced practitioner/reporting radiographer roles in the United Kingdom with appropriate education and support.<sup>26</sup> This reflects well on the potential to develop radiographer reporting in Australia.

The promising work of Neep et al.<sup>20</sup> produced some valuable findings and, together with evidence available from the United Kingdom,<sup>11,13,21</sup> suggest potentially that Australian radiographers may be able to offer a positive contribution to the trauma diagnostic pathway. Accuracy of radiographer image interpretation and confidence in participating in PCE and definitive reporting will improve with appropriate education and training.

## Conflicts of Interest

The author declares no conflict of interest.

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Nick Woznitza  
Reporting Radiographer, Radiology Department,  
Homerton University Hospital, Homerton Row,  
London E9 6SR, United Kingdom.  
Tel: +44 208 510 7105; Fax: +44 208 510 7107;  
E-mail: [nicholas.woznitza@nhs.net](mailto:nicholas.woznitza@nhs.net)