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## Review article

# Does advanced practice in radiography benefit the healthcare system? A literature review

S.E. Thom

Radiography Department, Faculty of Health, London South Bank University, 103 Borough Road, London, SE1 0AA, UK

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## ABSTRACT

*Objective:* With ever-increasing demands on the National Health Service (NHS), members of staff are blurring their professional boundaries in the attempt to benefit the healthcare system. This review aims to establish whether advancing practice within radiography does benefit the healthcare system by examining published literature.

*Key findings:* Key words were input into databases such as: CINAHL, Science Direct and PubMed. Various filters were applied to narrow down the articles. Key themes were identified within the literature: cost, job satisfaction, patient benefits, restrictions and workload. Having advanced practitioners undertake some of the radiologists' workload was potentially cost effective whilst continuing/increasing the standard of quality. Patients benefitted from the quality of their examinations, the high accuracy of their reports and the speed those reports were attained.

*Conclusion:* Evidence within the literature emphasises that advanced practice does benefit the healthcare system by means of: cost reduction, job satisfaction, patient benefits and workload.

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## Introduction

There are a number of factors that are placing increasing demands on the NHS, these include: staff shortages; an ever increasing workload; and, most importantly, cost. The King's Fund<sup>1</sup> stated that the NHS had a deficit of nearly £1.2 billion with debt predicted to rise each year. The NHS Confederation<sup>2</sup> validates their prediction by revealing the deficit of 2015/2016 had risen to approximately £1.9 billion regardless of increased funding.

These three factors affect numerous departments within hospitals including radiology. The Health Service Journal<sup>3</sup> state that there has been a 15 per cent rise in the number of common imaging tests performed each year. This fact is not helped by the ever declining staffing levels. The Royal College of Radiologists<sup>4</sup> detail the extent of the radiologist shortage by estimating that there are 48 radiologists to every one million of the population in the UK. The Office for National Statistics<sup>5</sup> predicts an increase of approximately 3 million in the UK's population over the next three years. This statistic becomes even more sobering when compared to the low rate of employment for radiologists, especially as The Royal College

of Radiologists<sup>6</sup> consensus anticipated that 20 per cent of the radiologist workforce would be retired by 2019.

The Kings Fund<sup>7</sup> acknowledged that there are currently struggles within the NHS to recruit and retain permanent staff. For numerous reasons, professionals not only in radiology, change career or turn to agency work after only a short period of time post registration.

The Government and many organisations have provided insights into possible solutions for these problems over the years. In 2001, The Department of Health (DoH)<sup>8</sup> created consultant positions for allied health professionals to meet with demands. The DoH<sup>9</sup> later set out a four-tier model which consisted of: assistant practitioners, practitioners, advanced practitioners and consultant practitioners. They describe an advanced practitioner as one who works autonomously in practice whilst continuously developing their practice within their own field of expertise. The whole idea of the four tier structure was to improve patient care by defining a multidisciplinary team by their skills and not by their profession, whilst retaining staff and promoting lifelong learning.

NHS England<sup>10</sup> came up with a Five Year Forward View, here they detailed that action would be needed in regards to: demand, efficiency and funding of the NHS. Two years on, Health Education England<sup>11</sup> detail many challenges still facing the NHS and state that the current model of care is unsustainable.

E-mail address: [sophiaelizabeththom@icloud.com](mailto:sophiaelizabeththom@icloud.com).

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Advanced practice in radiography can entail a number of diverse roles. Mathers and McKenzie<sup>12</sup> list these roles in their study as being: reporting radiographers, consultant radiographers, radiographers undertaking procedures such as injections, barium swallows, hysterosalpingograms and extended roles in angiography and ultrasound. To become an advanced practitioner, qualified radiographers must have completed two years or more of professional practice. They must then complete a Master's degree or equivalent in the area of interest within the scope of advanced practice. These are often undertaken at an educational establishment or through the practitioners' workplace. A survey by Miller et al.<sup>13</sup> found that the number of radiographers undertaking advanced practice had increased from previously conducted surveys.

This systematic review aims to synthesise relevant literature to determine whether advanced practice in radiography benefits the healthcare system.

## Method

The literature chosen were sourced by performing a comprehensive search using three well-established medical databases: CINAHL, Science Direct and PubMed. Key words such as 'advanced', 'practice', 'practitioner', 'radiography' and 'benefits' were used to search through the relevant literature. As there were a high number of results, various filters were applied. The date of publication was restricted to 2010–2016 for more pertinent literature; however one article from 2009 was kept as it proved to cover many important areas for this review. Only articles that had been peer-reviewed were selected to ensure that the information used had been critically evaluated and thus could be considered more reliable. Any articles found that were not written in English were excluded. Furthermore, only those articles with unrestricted accessibility to their full text were considered for this review.

## Results

21 articles were found using the aforementioned search terms and applied filters. The majority of the sources were UK-based with four originating from outside of the UK. These four were included as they offered a relevant insight into the subject chosen and their origin did not detract from this. Of those collected, six were dismissed due to being considered irrelevant to this review.

The literature was then critically appraised using the framework set out by Parahoo.<sup>14</sup> Common themes found within the literature were: workload, patient benefits, cost, job satisfaction and restrictions. These were noted to help synthesise the information provided ready to be discussed (Table 1).

## Discussion

### Workload

The most common theme found through the majority of the literature was that of workload. Nearly all of the articles chosen commented on the on-going issues of workload and how advanced practice in radiography can positively affect this.<sup>15–26</sup> None, at any point, mentioned any negative issues regarding workload. All of the articles that mention this theme comment upon the excess workload of radiologists who are swamped in un-reported examinations and too busy to carry out certain procedures. Several also mention the on-going delays in patients' reports due to radiologists being in high demand.

A comparative study by Buskov et al.,<sup>15</sup> in which plain-films were reported by radiographers and trainee radiologists, resulted in them endorsing radiographers as a suitable alternative to

radiologists to meet with the growing workload demands. The radiographers' reports were of a significant high standard compared to those of the trainee radiologists. The radiographers' sensitivity for correct diagnosis was 5 per cent higher than the trainee radiologists. Having radiographers reporting plain film images were, subsequently, recommended as an option when working outside routine hours. This recommendation was echoed by Snaith et al.<sup>16</sup> as they divulged that the delayed reporting situation remained primarily between Monday and Friday. They went on to stress the importance of change in order to efficiently deliver a 7-day NHS. Henderson et al.,<sup>27</sup> Field and Snaith,<sup>17</sup> Page et al.,<sup>18</sup> Plessis and Pitcher,<sup>19</sup> Reid et al.,<sup>20</sup> Torres-Mejia et al.,<sup>21</sup> Lockwood<sup>22</sup> and Snaith et al.<sup>23</sup> all make the same conclusion that, by having radiographers under-going advanced practice, will lead to decreased workload for radiologists, along with other professionals.

A longitudinal analysis into radiographers' reporting by Snaith et al.<sup>16</sup> clarified that, even though there was significant evidence to suggest reporting radiographers were contributing to the reporting capacity, the healthcare system is not utilising their skills. Milner et al.<sup>24</sup> add that there are still further opportunities to increase advanced practitioner capacity in radiography. The NHS Benchmarking Network<sup>28</sup> reported that, during the 2015/2016 period, 21 per cent of all reporting was performed by radiographers and sonographers. With this, they found that waiting times for reports improved by 1–2 days from the previous year. The results from the literature accentuate the positive effect that advanced radiographic practitioners have on workloads.

### Patient benefits

Having radiographers undertake advanced practice has been shown to present many benefits to patients. Judson and Nightingale<sup>29</sup> underlined many such benefits in their retrospective audit. To do this, they adapted a method in which three radiographers performed and interpreted 962 barium swallows and meals (BSM) over a 4-year period. These examinations were predominantly performed and reported by radiologists. All (962) examinations were of diagnostic quality with corresponding sensitivity and specificity rates of 99% and 98%, respectively. The authors commented that these results were considerably higher than any others previously published. These results demonstrate that radiographers can perform these examinations with a very high accuracy rate, much greater than the Trusts' standards of 90 per cent. This high degree of accuracy is evidently of benefit to patients. They also found that having radiographers perform the BSM examinations gave radiologists more time to focus on other work, consequently reducing patient waiting times. Newman and Nightingale<sup>30</sup> state that waiting referral to examination times are one of the top patient complaints.

Literature in the years following this study only further strengthens Judson and Nightingale's<sup>29</sup> findings regarding the patient benefits of having radiographers undertake advanced practice. Buskov et al.<sup>15</sup> compared the accuracy of 500 radiographers and 500 trainee radiologists in reporting plain-film images in Denmark. They discovered a significant difference in the correct diagnosis from the radiographs between the two professions. Radiographers' sensitivity was 99 per cent, 5 per cent greater than that of the trainee radiologists. This noteworthy variance only emphasises the point that advanced practice can benefit patients, not only through higher accuracy of reporting but also by reducing the amount of missed bony injuries leading to patients having to re-attend emergency departments.

An African study by Plessis and Pitcher<sup>19</sup> also compared plain radiographs being reported by radiographers against those

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