Assistant Radiographer Practitioners: creating capacity or challenging professional boundaries?

Abstract

Introduction

Over the last 2 decades the assistant radiographer practitioner (ARP) role has been introduced into NHS diagnostic imaging departments as a strategy to expand the workforce and create capacity. This skill mix initiative has not been implemented in a standardised way and there is limited knowledge of the current role scope within general radiography (X-Ray).

Method

An electronic survey of ARPs working within UK diagnostic imaging departments was conducted. Both open and closed questions sought information regarding basic demographic data (age category; gender; geographic region), scope of practice (patient groups; anatomical regions; imaging outside of the diagnostic imaging department), limitations placed on practice, supervision and additional roles.

Results

A total of 108 responses, including 13 trainees, were received. Most sites employ three or less ARPs in general radiography (n=43/66; 65.2%), although 11 sites have five (range 1-15). The majority undertake imaging of both adults and children (n=85/108; 78.7%), although limitations on age were described. Their scope of practice covers a broad anatomical range and included some non-ambulant patients. The level of supervision varied with some sites empowering ARPs to check the referral prior to examination (n=25) or images post acquisition (n=32) (both n=20/66; χ^2=16.003; p=0.000).

Conclusion

ARPs are helping to maintain capacity in imaging departments but we suggest there is further scope for expansion. The practice described by the post holders suggests that many are working beyond the scope envisaged by the radiography professional body.

Introduction

The assistant radiographer practitioner (ARP) role was formally embedded into diagnostic imaging in the early 2000's after being piloted for a review of the skill mix of the NHS radiography workforce.[1] The specific aim of the skill mix strategy was to expand the imaging workforce by implementing a four-tier structure, from assistant to non-medical consultant. This was seen as a way to cope with burgeoning demand, providing a development route for support staff and enabling the expansion of the role of registered radiographers.[1-3] Within healthcare, assistant practitioners are defined as:

'A worker who competently delivers health and social care to and for people ... able to deliver elements of health and social care and undertake clinical work in domains that have previously only been the remit of registered professionals'[4]

Assistant practitioners are expected to deliver protocol-based care under the direction of a registered professional.[2] Usually educated to Level 4 or 5,[5,6] a foundation degree or other similar academic award, alongside the completion of work based training in the clinical environment. However, the role and scope of assistant practice have been found to vary between health professions and employers, with tension between policy definitions and implementation.[3,7] Cancer workforce plans announced in 2017[8] announced plans for in excess of 2000 additional diagnostic radiographers and a further 300 more advanced practitioners by 2021, therefore opportunities to grow the entire imaging workforce are needed. A lack of local workforce planning has hindered benefit realisation in the utilisation of ARPs[9] and therefore there is a need to identify the purpose of this tier and its' contribution to greater imaging capacity across all levels.

There is limited knowledge of current assistant practitioner numbers or the breadth of their role in contemporary practice. Previous research identified supervisory issues, limitations on departmental flexibility and impact on undergraduate student training.[7,9-13] This article reports on a national survey to explore their role and scope of practice within imaging. This article has a specific focus on general radiography (X-Ray) and aims to provide insight into the role and post holders. Further discussion of the ARP role across all imaging modalities will be presented in a separate paper. For clarity the term *assistant radiographer practitioner* has been used throughout this paper to distinguish the role from posts created at this level within other health professions or clinical settings.

Method

This study was a UK survey of radiography ARP practice within diagnostic imaging departments utilising an electronic survey tool (Bristol Online Survey®, Bristol, UK). An initial invitation was

distributed as a paper letter to radiology managers of all UK NHS Trusts (or Health Boards) identified from Government statistics and national hospitals databases (n=218). Although there are a number of independent sector providers of imaging services, the authors are cognisant of the expectations of the Cancer Workforce Plan[8] in relation to imaging capacity and radiographer number growth, so therefore the survey was directed at NHS provision. No formal ARP database exists, thus a snowball sampling method was adopted whereby radiology managers and ARPs were asked to share the invitation with other ARPs known to them. Additional strategies to increase recruitment were initiated including a notice in the monthly radiographer professional journal (Synergy News) and through social media. All mailings provided an introduction to the purpose of the research, information regarding voluntary participation, data to be collected (including its management) and a link to the survey.

The survey remained open for 12 weeks between August and October 2017, with a reminder letter addressed to the 'Assistant Radiographer Practitioners' at each organisation distributed 4 weeks before the closing date. Prospective participants were provided a contact email address for a member of the study team (DP) if there was any uncertainty about whether the survey was of relevance to their role. To ensure accurate response analysis, invitees were asked to complete the survey only once.

Following a review of the literature, the survey was developed to comprise both closed and open questions specific to general radiography, including basic demographic data (age category; gender; geographic region), scope of practice (patient groups; anatomical regions; imaging distant to the diagnostic imaging department), limitations placed on practice, supervision of practice and additional roles. Where appropriate, respondents were asked to provide additional free text comments. Relevant responses have been reported in the results with the unique identification (ID) number of the respondent. An initial pilot study was conducted using a small cohort of ARPs and radiographers which resulted in minor amendments to the questions to aid comprehension. This data was not included in final analysis and the ARPs involved were free to participate in the main survey if they wished.

The survey collected anonymised data, with only fundamental demographic information requested to assist in generating a overview of respondents. As this was an evaluation of current practice ethical approval was not required following Health Research Authority (HRA) guidance .[14] However, ethical issues were considered following discussions with the local Research and Development department and the study adhered to good research practice guidance. Respondents consent was

considered to be implied by reading the study explanatory introduction and by completion of the survey.

Following closure of the survey response data were downloaded into Excel® (Microsoft Corporation 2010, USA) to allow for descriptive analysis and exploration of free text responses, further statistical analysis was performed using IBM SPSS (Version 24.0, Chicago, US).

Results

Demographics

A total of 108 responses, including 11 trainees, were received from ARPs working within general radiography. Although responses were received from all four home countries, the majority were from England, (table 1). All ARPs who have completed their training (qualified) confirmed they were paid at band 4 under Agenda for Change (AfC) with trainees at band 2 (n=4), band 3 (n=6), band 4 (n=2) or through AfC Annex U agreements (n=1). Two of the qualified ARPs stated they were undergraduate radiography students working as an ARP part time.

Table 1: Assistant radiographer practitioner survey responses by geography

Country (and English region)	Qualified ARP	Trainee ARP	Total responses n (%)	Total employers
England	**63 (66.3)**	**13 (100)**	**76 (92.6)**	**47 (71.2)**
East Midlands	5	-	5	3
East of England	6	-	6	5
London	3	-	3	3
North East	5	3	8	2
North West	11	1	12	10
South East	5	-	5	4
South West	5	1	6	5
West Midlands	6	5	11	7
Yorkshire & Humber	17	**3**	20	8
Northern Ireland	**3 (3.2)**	**-**	**3 (2.8)**	**2 (3.0)**
Scotland	**17 (17.9)**	**-**	**17 (15.7)**	**11 (16.7)**
Wales	**12 (12.6)**	**-**	**12 (11.1)**	**6 (9.1)**
Total	**95**	**13**	**108**	**66**

Most sites employ three or less ARPs in general radiography (n=43/66; 65.2%), although 11 sites have five (range 1-15). Nearly two thirds of the qualified ARPs (n=61/95; 64.2%) work full time (≥37.5hrs per week), but only 22 (n=22/95; 23.2%) work weekends or evenings as part of their core hours. Although the majority of ARPs work alongside student radiographers with a radiographer in

attendance, one third of the qualified ARPs (n=33/95; 34.7%) indicate they work alone with students.

Scope of practice

The majority of ARPs examine adults and children (n=85/108; 78.7%) although limits on children's age were often cited these varied (3-16years), with some suggesting that only babies or young children would not be included. The most common lower age limits were stated as 5 years (n=12) or 12 years (n=23), although this was seen to vary between organisations. Individuals described specific practice including: "*able to xray on children from 12 to 18 -extremities only*" (ID 25129682), or "*can image from 6 years of age not below that*" (ID 25154923). Whereas one stated that the "i*maging of paediatrics under 16 require supervision from Radiographers*" (ID 25813679). Additionally, for those who stated their scope to be limited to adults there was some debate as to the definition of 'adult', with some citing 16 years of age, whilst others suggested 18 years and the term 'Gillick competent' was also referred to by four respondents.

Most stated that they can undertake imaging of the chest, abdomen, appendicular and axial skeleton (n=80/108; 74.1%), although almost half of these (n=39/80; 48.8%) indicated specific limitations in relation to skull, face and dental examinations. The majority of ARPs (n=101/108; 93.5%) stated they could examine non-ambulant patients, although many described restrictions, for example "*patients in chairs or trolleys can [be] examined as long as the examination does not require modified technique*" (ID 25182279) and "*Non ambulant chest and extremities*" (ID 25832900). A number also confirmed such patients were undertaken alongside a radiographer, "*I work closely with qualified radiographers when examining non-ambulant and emergency patients*" (ID 25698389), "*Non ambulant patients that require assistance are carried out under the supervision of or assisting the radiographer*" (ID 25186231).

When the specifics of supervision was sought 87.9% (n=95/108), including eight trainees, confirmed it was usual to perform the examinations without radiographers present, although most stated a radiographer was available. Further free text comments provided include: "*indirect supervision at all times*" but the same ARP stated: "d*irect supervision with patients under 5yo* [years old]"(ID 25322594).

Workplace pressures were cited as the reason for the boundaries of practice to be stretched. Unsolicited descriptions of staffing shortages were provided by five ARPs, with example impacts being the relaxation of limitations on practice, including "[do not examine] *children under five (which doesn't always happen if short staffed)"* (ID 25119204). In addition one stated that:

"*We are not supposed to do trolley patients or patients deemed "too ill" but this would be impossible in our department and due to staff shortages we do them and feel confident doing them*." (ID 25349288)

Decision making

39 respondents indicated that the referral forms are not checked by a radiographer prior to the examination being performed. Of these, two indicated this was because the referral was checked at the booking stage. One stated that "*if I am unsure of anything I have a radiographer available to me at all times. I run GP lists of my own as all requests are vetted prior to the patients attending*" (ID 25154923). The remainder of respondents described the review of the referral and the subsequent decision to proceed with imaging to be a core part of their role as an ARP. This was illustrated by the comments: "*If clinical information is not understood or unjustified it is discussed with a radiographer*." (ID 25399943) and "*once qualified my job role will include justification of requests for A/E patients and clinic patients and lone theatre working*" (ID 25145079).

Further, 45 ARPs (41.7%) indicated that their images are not checked/approved by a radiographer before the patient leaves the department, with some providing justification for this based on established standards, for example, "*Authorisation has been given to pass my own images. Audit is carried out annually*" (ID 25399943). Such practice appears to be most common for internal hospital referrals, with 19 (n=19/45; 42.2%) providing this clarification. This autonomy included referrerals from clinics, emergency departments and wards, as illustrated by the ability to discharge, "*patients returning to a ward/department within the hospital*" (ID 25122060) or "*if patient is being seen in clinic, a/e or the ward I can send the patient without checking*" (ID 25310275). Importantly, this autonomy included examinations being auto-reported, with one ARP stating in response: "[images checked] *for the majority of our work, but no for follow up clinic CXR's that are not for report*" (ID 25359501).

When hospital sites that do not require radiographers to check referrals prior to examination (n=25) or images post acquisition (n=32) were compared for qualified ARPs there was a statistically significant relationship (both n=20/66; χ^2=16.003, 1df, p=0.000). Although the variation in these responsibilities was illustrated by one respondent who stated that "*once signed off as competent we can justify our own request cards just need a radiographer to check the final image*" (ID 25121876).

The majority of sites allow qualified and trainee ARPs to undertake repeat or supplementary projections (qualified n=65/95; 68.4%; trainee n=7/13; 53.8%).The ARPs described being "*able to use own judgement when I know something can be improved or needs improving*" (ID 25737671). This is

often limited in number: "… *allowed to take one repeat image before asking a radiographer for help*" (ID 25157290), but this appears to vary with status with one ARP stating "*Currently 1 repeat xray. Once I have been qualified for a full year this will increase to 2 repeat xrays*" (ID 25198284).

Other roles

With regards to activities outside of the imaging department four ARPs, from three different sites, confirmed they undertake mobile examinations on their own with another 41 confirming they perform mobile examinations with a radiographer. Additionally, four ARPs, from three sites, undertake theatre imaging using an image intensifier without a radiographer, with a further four stating a radiographer is also in theatre.

Alongside the general radiography ARP role, a small number also work as an ARP within other modalities, specifically bone densitometry (n=7) and fluoroscopy (n=11). In addition, some described acting as a support worker or chaperone in other imaging modalities. Many ARPs highlighted having also taken on additional roles, including those in a training capacity on equipment or in basic life support skills. They are also undertaking systems management support and quality assurance whilst others described roles as infection prevention lead or dementia champion.

Discussion

Skill mix was seen as a way to increase diagnostic imaging capacity,[1] in both acquisition and reporting.[15] In the 15 years since the publication of the report from the skill mix pilot sites, imaging department activity has continued to grow without constraint.[16] However, the role of ARPs does not appear to be fully embedded into practice, with variations in numbers and scope continuing to limit their impact. The response rate of the survey is not known as there is no single database of ARPs maintained and accreditation with the SCoR is voluntary.

There are only a few reported examples of the actual impact of ARPs in practice, Woznitza et al[17] in their case study of team working described how ARPs were contributing to imaging activity, undertaking almost one quarter of general radiography examinations. Whereas Bennion and Irvine[18] and Price et al[9] found that managers identified few benefits, other than cost savings, due to limitations on their practice. Guidance for the ARP scope of practice is provided by the professional body, the Society and College of Radiographers (SCoR), as it remains an unregulated tier.[2] The 2012 guidance expected that imaging services would develop local guidelines based on their defined

needs, outlining their scope of practice and scheme of work. Importantly, there is no specific ratio for registered to non-registered staff in imaging[18] however, in the opinion of the authors, the numbers will depend on size of organisation, patient throughput and complexity. As seen in our research, this unknown invites variation and individual interpretation of the role and practice boundaries. This in itself is perhaps not surprising given the lack of standardisation within the higher level (advanced and consultant) radiographer tiers.[13,19,20]

There was always an expectation that the introduction of the ARP role would enable workforce expansion to release experienced radiographers to take on additional roles, in particular reporting.[1] This vertical task sharing between medical, radiography and support staff was seen as critical to delivering greater access to imaging and constraining cost.[1,13,17,21] Service pressures appear to be instrumental in pushing the ARP boundaries of practice with some respondents citing staffing levels as the main reason for their level of autonomy. This may also be impacting on radiography pre-registration student training, with one third of ARPs stating they work with students alone, this is concerning given both groups require the supervision of a registered staff member. It is stated that ARPs can examine ambulant, co-operative patients who are able to effectively communicate.[2,22] In general radiography the anatomical scope of practice is defined as:[2]

- Axial skeleton excluding skull and cervical spine (if result of trauma)
- Appendicular skeleton
- Chest and Thorax
- Abdomen and pelvis

Although the criteria suggest that independent examination of children is beyond the scope of an ARP, there is flexibility where no modification of technique is required to perform imaging on children capable of consent to the examination. This 'Gillick' competence[2,22,23] was referred to by a number of respondents and will also include those examining patients over 16 years of age. Such issues have been identified previously,[11,20] however suggesting that an ARP may perform an examination on a young child without direct supervision is considered inappropriate by the SCoR.[2,22,24]

The supervision concept is important in discussion of ARP roles and the different types were identified by the respondents. Direct supervision is defined as 'working alongside a radiographer' and this is appropriate for trainees and where the examination is considered complex or requiring adaption of technique.[2] This should not preclude an ARP from exposure to such cases, but does require the presence of a registered radiographer to take responsibility for the conduct of the examination.[2] Indirect supervision occurs when the radiographer delegates the performance of all,

or an aspect of, an examination. The radiographer must first have ascertained that the examination is appropriate and within the scope and competence of an individual ARP.[2] They are unlikely to oversee all the imaging but they do retain responsibility for the act of delegation. The grade or experience of the radiographers supervising the ARPs was not sought in this survey, however Henderson et al[13] found that rather than this being the responsibility of a senior radiographer (band 6 and above) it was being delegated to junior (band 5) staff.

Like Stewart-Lord et al,[11] an important finding in this study is ARP performance of examinations remote from the imaging department, in particular mobile or theatre examinations. This relies on indirect supervision, but an assessment of the situation, patient condition and radiation protection implications cannot be performed remotely. Although a small number of sites had authorised ARPs to undertake examinations outside the imaging department, the SCoR considers that these are not a suitable examination to be performed by an ARP because of the need for adaption of technique and immediate clinical decision making. This is particularly relevant where direct digital radiography provides an instant image and a preliminary clinical evaluation of appearances is required, for example to escalate urgent findings requiring immediate intervention such as the malposition of nasogastric tubes or other clinical interventions.[25]

The SCoR have recognised the need for the development of the ARP role and scope over time to meet local service needs.[2] A mechanism for national approval of new practices is in place[2] and ensures that accredited ARP members of the SoR are provided indemnity insurance for their practice. It is not clear whether departments who have implemented a broader scope, including independently performing mobile examinations, have undertaken such a process. However, it may be that a radiographer, who knowingly allows an ARP to work beyond the SCoR guidance[2] without authority from their employer, and potentially the review of the SCoR, would place themselves, their indemnity insurance and their registration at risk. The responsibility for justification of examinations lies solely with the radiographer (or radiologist depending on local procedures) and must not be completed by an ARP.[2] Some departments use 'authorisation under protocol' as an alternative approach to justification, whereby the decision to proceed with an examination is based on a review of the clinical history and presenting complaint against a list of defined criteria signed off by an Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) practitioner.[26,27] The SCoR consider that ARPs may proceed with an examination where such a protocol is in place without the referral being seen by a radiographer (personal communication M Murray 2017). This relies on the education and training of the ARP being adequate to be entitled to undertake this IR(ME)R operator role within their scope of practice. The term 'justification' is restricted to registered health professionals,[28]

although many organisations consider this to be limited to medical radiologists even within general radiography. Based on the results of this survey, greater awareness of the appropriate use of the terms related to justification is required to ensure activities are carried out only by individuals with the appropriate skills, knowledge and authority.

One issue identified in the study is the need for radiographers to check/approve images before the patient leaves the department as the *satisfactory discharge of patients is the responsibility of the supervising radiographer*.[2] Despite this, 41.7% of ARPs stated that they did not have their images checked by a radiographer before the patient left the department. The SCoR acknowledge the development of local schemes of work and suggests that where the images will be immediately reviewed by the referring clinician the supervising radiographer (if there is one) can make the decision not to check/approve the images.[2] However, this raises concerns regarding the competency of the referring clinician to make an informed decision regarding the image findings. In the last year, the Care Quality Commission inspections of radiology services have identified major issues with autoreporting.[29,30] This included concerns regarding the delegation of the interpretation of images to clinicians who do not deem themselves competent to interpret them.[30] This practice of auto-reporting, where imaging departments do not formally report examinations, is a common occurrence within UK hospital practice,[30] to reduce costs[31] and accounted for up to 10% of examinations in 2016-7.[32] However, unexpected issues are raised by this study as we have identified that there is potential for referrals and images to never be reviewed by a registered imaging professional (radiographer or radiologist). ARPs do not carry the same responsibility to recognise abnormal image appearances as a registered radiographer.[33] Further, they are unlikely to have had completed a programme of education for image interpretation to support independent preliminary clinical evaluation,[25,34] this does introduce a new dimension to this expansion of the ARP practice.

Limitations

The lack of a reliable number of ARPs and route to survey individuals does limit confidence in the representativeness of the sample and hence the ability to draw conclusions. The respondents to the survey have provided their own interpretation of their scope of practice and this has not been verified with individual organisations or managers. The common themes identified do however provide some evidence of the reliability of the findings.

Conclusion

This study has demonstrated that ARPs are helping to maintain capacity in imaging departments, but the relatively small numbers in post suggest there is scope for further expansion of the workforce. The practice described by the post holders confirms that many are working beyond the scope envisaged by the professional body and are undertaking aspects of care previously considered to only be consistent with registrant radiographers. We surmise that this has been driven both by staffing pressures and the experience of individual ARPs, but this raises questions about blurring of the boundary with the entry-level radiographer role without enabling the continued formal education of the ARP or appropriate financial reward.

Further work is required to identify whether the ARP role has been fully embedded into clinical practice. In particular what could, particularly in this time of significant workforce pressures, enable optimal utilisation of the assistant role to release capacity within other tiers?

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