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Research article

Diversity in radiation therapist/therapeutic radiographer (RTT) advanced practice (AP) roles delivering on the four domains



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ABSTRACT

Introduction: Advanced practice roles are well documented, and continue to respond to the changing landscape in radiotherapy and oncology. In the UK the highest level of AP for the therapeutic radiographer/radiation therapist (RTT) is the consultant radiographer. These posts should meet the four domains of practice, as set out in national guidance. Here we aim to describe well established roles that meet this criteria, and provide subgroups of examples.

Methodology: Three AP post holders with over 10 years AP experience completed a questionnaire adapted from the consultant radiographer toolkit. These were completed in conjunction with guidance and framework documents. The examples were to demonstrate how they achieve a high level of practice in clinical and expert practice; professional leadership and consultancy; education, training and development; and practice and service development, research and evaluation. Participants then categorised results to add subgroups to each domain.

Results: The questionnaire was completed by three RTTs specialising as a lung consultant radiographer (LCR), a neuro-oncology consultant radiographer (NCR) and a lead research radiographer (RR). Each post holder described how they meet the criteria by discussing the benefit they make to their profession, department and patients. All posts had examples for all criteria, achieving consultant practice. Clinical and expert practice was the dominant domain for the clinical specialist posts, and professional leadership and research evaluation was the strongest domains for the RR.

Conclusion: All three consultant RTTs have demonstrated expert practice with clear and transparent examples of their professional practice which evidence the four domains of consultant practice. Following two decades of AP practice for RTTs there is a need to be strategic in the development of future posts with a prospective view on succession planning that safeguards their longevity.

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Introduction

Role development and advanced practice (AP) for the therapeutic radiographer/radiation therapist (RTT) is well documented globally [1–3]. With radiotherapy (RT) playing a vital role in cancer care and a necessity to improve patient access to it, strategic development of AP roles are even more important than ever [4].

In response to staff shortages and the need to modernise the radiography workforce, the UK Department of Health (DoH) published its model on the 4 tier structure [5]. This introduced development opportunities for radiographers, including career progression to an advanced and consultant level. For the RTT, this has been important in developing themselves within the

multi-disciplinary team (MDT), and creating the culture of life-long learning. The Society and College of Radiographers (SCoR) have continuously developed guidance to support this in the UK, and provides a mechanism to underpin the structure [6,7].

In the UK, the highest level of AP framework is the consultant radiographer which is based on achieving a high level of practice within four domains that include: Clinical and expert practice; professional leadership and consultancy; education, training and development; and practice and service development, research and evaluation [5,7]. There is an expectation that consultant roles will consist of 50 per cent expert practice and clinical work, although this is not necessarily face to face patient interaction. The remaining 50% should be distributed across the other domains, e.g. research and development, education and training and professional leadership [7]. It is recognised that domains are not mutually exclusive, and there will be areas of practice that fulfil several domains.

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Postgraduate education is mandated for these posts. The SCoR currently recommends that consultant radiographers should be working at full master's degree qualification. In the future, there will be an expectation that consultant practitioners will either hold, or be working towards a Doctoral level award. Outside the UK, groups have been instrumental in developing frameworks to support AP, ensuring they are implemented to the highest standards and underpinned by relevant postgraduate study [3,8,9]. The European Society of Radiotherapy and Oncology (ESTRO) have also supported AP, with highly specialist and expert practice benchmarked with level 7 and 8 descriptors from the framework of the European Higher Education Area (EHEA) [10,11].

Consultant job descriptions are developed in response to specific service needs and demonstrate diversity depending on these. The SCoR has issued guidance for the support of new and established roles [7]. This guidance includes a framework and specifications which can help to ensure consistency of the role in terms of level of practice and their alignment to the four core domains. Due to the nature of these being developed in response to service needs, job plans can not be prescriptive.

The literature clearly illustrates the wide variety in different posts, and why it is a challenge to standardise them. However, the benefit of such diversity is that professional opportunities are varied, improving job satisfaction and retention of high quality staff [11]. Guidance can be vague, and without adequate information on the range of activities that evidence consultant practice, developing new posts are still a challenge.

Aim

The aim of this work was to describe roles and responsibilities of three well established consultant level roles implemented in a single radiotherapy centre, and categorise themes in line with consultant practitioner criteria described by the Society and College of Radiographers (SCoR) [6,7].

Methods

A case study approach was used to collect data on three real world examples of specialist posts in a single centre. These roles were selected as they represented well established positions, covering a diverse range of specialties and were not based on theoretical job plans. Role development is complex and varied, and evidence from these real cases provide valuable information.

Rigour was addressed throughout the methodology by considering the four criteria described by Guba and Lincoln [12], i.e. credibility, transferability, dependability and confirmability.

Questionnaires were developed using a pre-existing SCoR consultant practice toolkit covering the four domains of practice (Appendix A) [13]. Examples within this document were non-specific, so the participants completed this in conjunction with existing framework and guidelines to identify levels of practice [6,7]. Each participant was asked to provide examples of roles and responsibilities within their own specific practice that demonstrate meeting these domains using a self-assessment method. This method was used to ensure a true reflection of real life consultant roles, reported first hand. Free text questions were included in the questionnaire to ask each participant about years of experience; what they found challenging about their jobs; and important factors in developing future posts.

The roles and responsibilities described by each participant were validated with respective managers to ensure they report a true description of what each one does. These had also been validated in the appraisal setting with clinical and research leads, and during personal development reviews.

For credibility reasons all participants met 2 weeks later to discuss the completed questionnaires. This allowed a period of reflection to ensure relevant and reliable data were recorded; provide further description of what each example involved; and to draw out themes. The group agreed on the themes and produced subgroups within each of the domains using inductive reasoning. The challenges within each role and important factors in developing new AP positions were also synthesised to produce themes.

Further data collection was carried out by literature searching and collating abstracts from conferences where the specialist was an author. A google search was used to capture any further contributions made at unpublished study days etc. These steps were to support examples using another format to ensure confirmability.

Results

Three AP roles were evaluated, this included a consultant lung radiographer (LCR), neuro-oncology consultant radiographer (NCR) and a lead research radiographer (RR). All 3 had over 10 years AP experience, and are currently working at consultant level. The LCR has been working as a consultant RTT for 8 years, the NCR became a consultant 1 year ago and was awarded Society of Radiographers Consultant Practice Accreditation in 2019. The RR has been in a consultant level position for 5 years.

Clinical and expert practice (Table 1)

Each specialist described clinical and expert practice relevant to their area of expertise. All posts actively contributed to the multi-disciplinary team (MDT) meetings where patient diagnosis and management was discussed, providing specialist and expert knowledge where individual cases can be optimised.

In the case of the LCR and NCR there was clear input in the full patient pathway, through from initial MDT discussions to follow up clinics post RT. This was the case for patients treated in the palliative and radical setting and included their own RTT led clinics and patient workload. The LCR is responsible for their own dedicated palliative clinic, prescribing, planning and approving RT. The NCR is in the final stage of competency to have a dedicated stereotactic radiosurgery (SRS) clinic.

All three specialists reported they obtained written and informed patient consent. For the site-specific practitioners i.e. LCR and NCR, this was for both radical and palliative patients and included discussions on treatment outcomes, acute and long term toxicities. For both this may result in difficult conversations with patients regarding a change in management plan, or breaking bad news. For the RR, patient consent was obtained for participating in clinical studies following discussion regarding the rationale and aims of the study, risks and benefits, as well as their rights to withdraw at any point.

All practitioners are involved in approval of images for their site specific team, including decision making on complex cases. This may be for hypofractionation or dose escalation e.g. SRS, lung stereotactic ablative body radiotherapy (SABR), or pancreatic RT where there is complex organ motion close to dose-limiting structures. Each can make a decision to replan based on image review. They also provide advice and mentorship to clinical staff directly involved in difficult cases.

Autonomous practice was evident across all AP examples. The clinical specialists describing input along the full pathway, including radiographer led clinics. The RR described leading on developments e.g. IGRT, and developing local research programmes from study concept to dissemination.

Table 1
Subgroups of roles and responsibilities that demonstrate clinical and expert practise achieved by each RTT.

Clinical & Expert Practice	LCR	NCR	RR
MDT recommendations	•	•	•
New patient clinic	•	•	•
Referral for radiotherapy	•	*	
Target delineation	•	•	
Peer review	•	•	•
Approve target volumes	•	*	
Treatment review	•	•	
Image approval	•	•	•
Palliative planning and prescribing	•	*	
Responsible for complex techniques	•	•	•
Re-plan based on treatment images	•	•	•
Diagnostic Image referral	•	•	
Independent Non Medical Prescribing	•	*	

• Consultant practitioner has completed the relevant task.
* Consultant practitioner in training.

Professional leadership and consultancy (Table 2)

All specialist RTTs are responsible for implementing evidence based changes to local radiotherapy protocols, by writing and reviewing practice changes within the quality system. The RR and LCR are both members of the local radiotherapy management group (RMG), where they can provide advice based on their expertise, and influence change. All specialists participate in the local radiotherapy research group where new research protocols are discussed and developed by the research team. The LCR, NCR and RR participate in the recruitment process for RTT staff, including specialist and consultant radiographers.

All participants have contributed to the development of RT national meetings or conference programmes. The LCR is a member of a British Institute for Radiology (BIR) special interest group developing educational meetings. The NCR has contributed to an international conference scientific committees, as a committee member. The RR has been involved in scientific advisory group for a number of ESTRO conferences, and has also been chair and co-chair.

With regards to consultancy, each RTT has provided expert advice to other departments in line with their specialty. This has meant offering support to other centres when implementing new techniques or AP positions. All have participated in national working groups for example, the LCR contributed to Consultant radiographer guidance produced by SCoR [7], the NCR is a member of the Allied health profession (AHP) AP strategy in Scotland 2019–2022. The RR is a member of Clinical and Translational Radiotherapy (CTRAD) research working group who are aiming to improve the RTT academic workforce. The RR is part of a Royal College of Radiologists (RCR) steering group contributing to an updated version of national image-guided RT guidance.

The RR is lead RTT and co-investigator on several multi-centre studies, and is developing radiotherapy guidelines for approval by the radiotherapy trials quality assurance group (RTTQA); has acted as chief investigator and principal investigator on clinical studies; and is a member of trials management groups for national/international multi-centre studies.

Education, training and development (Table 3)

A full MSc had been completed by all post holders in Radiotherapy and Oncology (MScRO) or Advanced Practice in Radiotherapy and Oncology (MScAPRO). The RR is currently a PhD candidate with a specialist interest in optimising RT for pancreatic cancer. All are guest lecturers to undergraduate students at local higher education institutions (HEI).

Table 2
Subgroups of roles and responsibilities that demonstrate Professional leadership and consultancy.

Professional leadership & Consultancy	LCR	NCR	RR
Responsible for local RT protocols	•	•	•
Participate in national RT protocols	•	•	•
Radiotherapy research group	•	•	•
Radiotherapy management group	•	•	•
Involved in recruitment	•	•	•
National working groups	•	•	•
International working groups			•
Lead practice change documents	•		•
Maintain national profile	•	•	•
Maintain international profile	•	•	•
Assessor of international courses			•
Faculty on international teaching courses			•

• Consultant practitioner has completed the relevant task.

Table 3
Subgroups of roles and responsibilities that demonstrate education, training & development achieved by each RTT.

Education, training & development	LCR	NCR	RR
Masters	•	•	•
PhD in progress			•
Mentor students	•	•	•
Mentor registrars	•	•	•
Lecture at university	•	•	•
Lead training for complex techniques	•	•	•

• Consultant practitioner has completed the relevant task.

All are responsible for producing training and education packages on complex imaging techniques e.g. lung SABR, abdominal soft tissue matching for SABR and write competency and assessment programmes when new technology is implemented e.g HyperArc for SRS [14,15]. All participate in specialist registrar teaching and provide mentorship for MSc students during dissertation projects.

The RR is the course director of an international teaching course (2020) on Research for RTTs and is currently the liaison person for ESTRO school courses to assess the suitability of educational content of these courses for RTT profession.

The LCR provides mentorship of two SABR radiographers to facilitate implementation of a new SABR service for oligometastatic disease. The RR leads and manages the research radiographer team, providing mentorship, support and encouraging RTT led research within the local strategy. The RR supervises RTT and medical student undergraduates on elective research placements.

Service development and research (Table 4)

All three participants have led service development projects. These projects have been audited and have been presented at national and international conferences.

The RR and the LCR have published in peer reviewed journals as first author [16–18]. The RR has published as senior author [19–21]. Each RTT has contributed to publications as co-author. The RR and the NCR are reviewers for radiotherapy/oncology journals providing peer review for other Expand to radiation oncology researchers. The RR has successfully secured funding for trials and has acted as both chief and principal investigator (CI and PI) for these studies [18,19,21]. The RR is a co-investigator on a Cancer Research UK Radiotherapy Research Network (CRUK RADNET) grant where RTT funding has been awarded to improve research infrastructure.

The NCR was awarded National Research Scotland (NRS) Career Researcher Fellowship in 2019 to allow RTT led studies in RT imaging features predicting the severity of neurological toxicity

Table 4
Subgroups of roles and responsibilities that demonstrate service development & research achieved by each RTT.

Service development & Research	LCR	NCR	RR
Lead service improvement	•	•	•
Lead implementation of new technology	•	•	•
Co-investigator trials	•	•	•
Principal Investigator clinical trials			•
Chief Investigator clinical trials			•
Responsible trial protocols			•
Secure funding for trials			•
Published in peer reviewed journals	•		•
Reviewer for peer review journals		•	•
Trials management group			•

• Consultant practitioner has completed the relevant task.

in elderly glioblastoma (GBM) patients. The NCR and the RR have close working relationships with research scientists to develop RT protocols for pre-clinical models using the small animal radiation research platform (SARRP).

Challenges

Themes identified as challenging for participants were the levels of scrutiny on consultant posts and the difficulty of justifying their benefit to stakeholders. Important aspects to consider for future development of posts were securing long term funding and succession planning.

Discussion

Here we describe how three well established AP posts meet the 4 domains of practice as defined by the SCoR, and provide additional subgroups of roles and responsibilities within consultant practitioner roles. Whilst each practitioner has a role suited to the changing service needs within their specialty, there are many themes consistent across them all, as we have shown in these results. The questionnaires are not an exhaustive list of roles and responsibilities, but give examples of meeting each domain. They do not represent time spent on each, or how well they were carried out. For this reason, they cannot be compared in terms of meeting standards. What is useful, is they demonstrate how each differ in terms of roles and responsibilities within the domains, and the themes that could be drawn out from them all.

Only one participant (NCR) has been awarded SCoR accreditation. This process has been completed by the NCR, as this recently became departmental policy for implementing any new consultant role. The voluntary SCoR accreditation process aims to measure and standardise practice across the four core domains of consultant practice. A requirement for this is to build an evidence based portfolio demonstrating the individual’s consultant practice [7]. Accreditation is strongly recommended, however both the LCR and the RR were in post before this criteria was in place and it wasn’t mandatory at that time. All participants hold full MSc qualifications which are mandatory in these roles and one is completing a PhD which was recommended at the time of this data collection.

A limitation of this case study is generalisability. This is due to the small sample size that includes three consultant level practitioners within one institute. To capture the depth and diversity of each individual role, it was essential that questionnaires were filled out by the post holder. Although a self-assessment could introduce bias due to subjectivity, this was deemed the most appropriate way to understand each post in depth due to participants being immersed in their roles. To reduce bias and subjectivity all examples were validated by their respective teams. Reliability was also addressed during the meeting by discussing the examples and confirming their consistency at different timepoints.

Rigour in qualitative research differs from that of quantitative research [12,22]. Steps were taken to ensure rigour throughout this piece of work and demonstrate trustworthiness. Data was collected from credible and trustworthy examples of consultant level roles to assure they are a true reflection of the social reality described. These roles were all developed with different MDT, independently of each other. This variation makes the outcomes more transferable, however a larger sample size would be required to improve generalisability.

For credibility, the data capture was carried out over a number of weeks using different formats including questionnaire, discussion and web searching. These are detailed in the methodology to address dependability.

Each practitioner described autonomous practice within their specialty, working together with a MDT to improve patient care. Increased responsibility was evident throughout posts, where they have successfully adopted tasks previously the sole responsibility of the clinical oncologist (CO). Each post holder has an assigned CO mentor, which is essential to the integration of any new post [7,23]. They each demonstrate leadership skills in developing services consistent with evidence based practice, and have disseminated their audit and research at national and international meetings; contributed to developments and policies internally and externally; and include contributions to high impact guidelines that shape practice. This is in line with other authors who describe leadership and influencing change [23].

A more detailed assessment of the AP was made by Harnett et al. [2], who described 7 key traits that defined an advanced practitioner, complimented by a theoretical framework similar to the Benner continuum of novice to expert practice [24]. These traits included additional knowledge; expert practice; integration of evidence; critical thinking and analysis; skills and aptitude that transcend a niche (transferable); enhanced professional practice; and autonomy. In this case study the subgroup examples within the four domains were consistent with the majority of these traits (Tables 1–4). The level of practice included in the theoretical framework described the highest level of practice as “advanced” which was deemed higher than “expert” and “specialised” and had additional descriptors to illustrate [2]. This differs from the framework used here, where consultant practice is the highest level recognised.

Systematic reviews have highlighted the lack of high quality data supporting AP in the radiography profession, especially evidence based on RTT [25]. A number of high quality primary studies have been published since then, raising the profile of the RTT profession e.g. RTT led IGRT studies [3]. RTT led studies demonstrate and example of AP and illustrate how they continue to push those boundaries.

A straightforward comparison of a transfer of task from one profession to another has been criticised, where different professions carry out tasks with different attributes [26]. This argument is also applicable to RTTs who may have different qualities to a CO which may enhance the way they perform certain tasks. Again, making a more holistic assessment of the role would highlight benefits that go beyond clinical tasks by capturing the other significant benefits of AP.

Clinical specialists

We have found that long standing posts have been a challenge to assess. As RTTs are already integrated and have been leading services, a comparative study between disciplines is not possible. The biggest opportunities to collect data on tasks transferred to the AP is when new posts do this prospectively by comparing the service pre and post the AP e.g. reduced waiting times, volume delineation studies, inter observer variation [27–30]. These are

important studies that not only verify that quality and patient safety is maintained, but provide clear descriptions of how others are extending their scope of practice. Other authors have used case studies, commentaries and other descriptive pieces [23,31]. These may have less scientific rigour at times, but they provide very useful information on the overall contribution made.

It is not possible to have a simplistic approach where one model fits all. Whether comparing roles in a single centre or practitioners worldwide, there will be diversity [31]. What is possible though is to ensure that national guidance and framework standards are consistently met by practitioners [6,7]. It is important this is assessed locally to confirm roles are reflecting up to date requirements of the service.

There is growing evidence that dedicated palliative AP roles within RT are becoming more prevalent. The LCR has demonstrated that having an element of the role dedicated to autonomous practice in palliative radiotherapy planning and prescribing can have a positive impact on patient pathways and improve the service delivered by the department by ensuring continual cover for CO annual leave and study leave [32,33].

Research radiographers

In research positions it is not always obvious what the clinical component of their role is. On the other hand, professional leadership, education and research are shown to be the strong components. Research radiographers require expert and clinical practice to design clinical studies, especially important in response to the nature of technology driven research [34]. These include development of research ideas through discussion with patient representatives in conjunction with supporting evidence, developing study methodologies relevant to the patient group, writing patient information, discussing study related information and going through the consent procedure before taking consent.

The implementation of new technology within studies may also require the researcher to attend clinical appointments with the patient to ensure that new protocols are delivered safely and accurately. Their expertise is then required to develop training and competency for clinical staff to take on these responsibilities once more routine. This is also true for the clinical specialists, where they lead on service developments.

There may be better ways of looking at the impact of research roles, e.g. the payback framework where the impact of research is assessed. The framework highlights more than just one dimension of the change evaluating knowledge; benefits to future research and its use; benefits from informing policy and product development; health and health sector benefits; and broader economic benefits [35]. Of course AP roles should show impact with regards to patient benefit, but there is a bigger picture. Assessing all components can show benefit to the department, scientific community, and society in general.

Funding for AP roles

Anecdotally, managers have felt that for AP roles with less direct patient care it is difficult to quantify benefit, so a validated framework could help illustrate these. The researcher in this paper is funded by a charity and the post was implemented a number of years ago as research was not considered under core funding. This was also the case for the LCR. There have been more developments in consultant funding coming from the National Health Service (NHS), unfortunately this is not true for research radiographers. National strategies have been useful in trying to develop researchers and encouraging RTT research engagement through all levels of practice, although funding is still an issue [36,37].

New AP roles & succession planning

The new AP may come equipped with excellent knowledge underpinned with higher level education, however starting off in a new role can be challenging. Working as a clinical RTT can mean working solely in a team of RTTs, frequently under intense circumstances. Experience is necessary to allow the RTT to negotiate complex situations and assess the bigger picture within these forums. AP and particularly consultant roles are under intense scrutiny to evidence their impact and benefit.

It can be stressful for the AP to constantly prove themselves to different stakeholders. The completion of progress reports, professional accreditation, reports to funders, etc. are time consuming, and are not infrequent. For AP positions, it is not a case of passing an exam or completing a period of training, these roles are constantly subjected to scrutiny from managers, inter-professional stakeholders, peers and professional bodies. This reinforces the importance of a supportive clinical team and departmental support [7]. Although there are no publications that discuss AP roles that have failed, there are examples of this.

AP posts are no longer in their infancy, and succession planning should be a priority to future proof specialist posts, otherwise there is a risk of losing them. Highly experienced staff should champion the development of others by raising the profile of successful career development and offering mentorship or supervision where required [23].

Conclusion

Our case study enhances the current literature that supports advanced and consultant practice. Here we have reported with clarity and transparency examples of AP posts meeting and evidencing the four domains of consultant practice, and provide subgroups of roles and responsibilities within them. The additional subgroups added to the questionnaire can be used as a basis in future work to repeat this case study nationally. This work can also be used to help departments understand opportunities that exist, when developing new and existing posts.

The post holders agree that achieving success in these roles has been made possible by developing expert level knowledge of their own site specific area; underpinning knowledge with postgraduate education; and maintaining support from multi-disciplinary clinical teams and RTT management. However they are all aware of the pressure associated with these positions e.g. the need to constantly expand their SOP, and justify their position to different stakeholders.

Following two decades of AP practice for RTTs it is necessary to be strategic in the development of future posts, with a prospective view on succession planning to safeguard their longevity.

Many centres already have long standing advanced specialist roles, or are beginning to introduce them. Either way, there is still need to ensure service needs are still being met, and improving patient care verified by local evaluation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

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