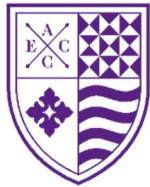


# Evaluation Report on the Impact of Advanced and Consultant Practice Roles within Radiography across NHSE WT&E South East Region

10 October 2023, Version 5



**AECC**  
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## Acknowledgments

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We are extremely grateful to the Service Leads and advanced and consultant practice radiographers in the SE region who gave their time to complete questionnaires and interviews, they have been instrumental to this project.

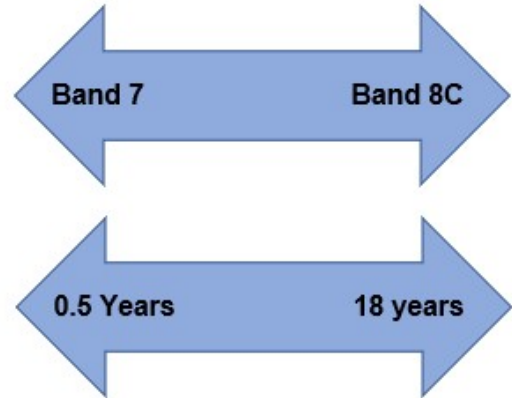
## Executive Summary

### In the SE region:

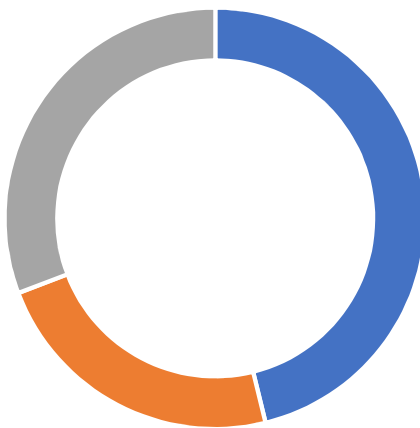
- ❖ Over 80 Advanced Practitioner Radiographers
- ❖ Over 13 Consultant Practitioner Radiographers
- ❖ 19 new posts in set up



- ❖ Band and experience range:

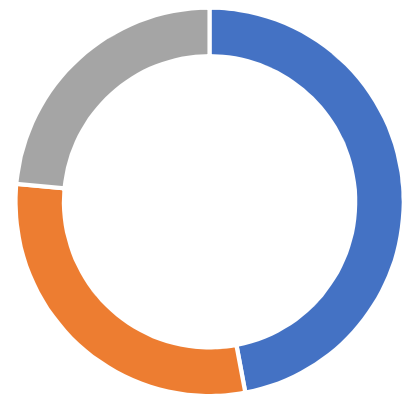


### Posts Have:



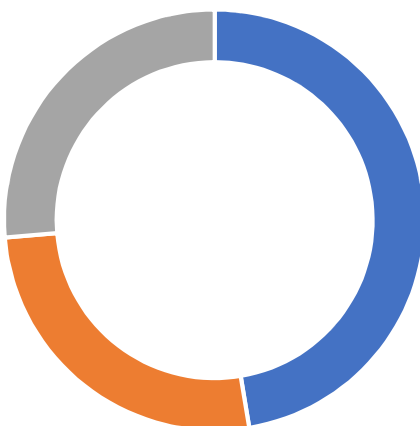
■ Evolved from previous posts ■ Set up as new posts ■ Both

### Rationale for introducing posts:



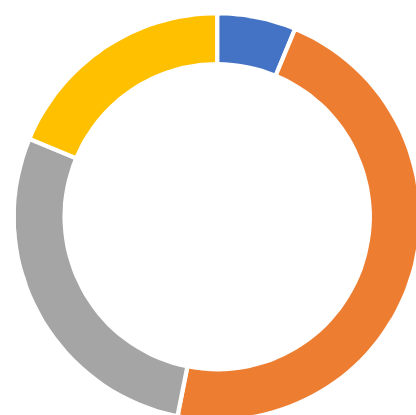
■ Recruitment and retention ■ Improve service provision  
■ Doctor shortage

### Barriers to introducing posts:



■ Financial ■ Doctor support ■ Cost and availability of training

### Educational backgrounds of post holders:



■ PhD ■ MSc ■ PgDip ■ BSc

Services reporting post holders with College of Radiographers or NHSE WT&E Centre for Advanced Practice accreditation:

**36%**

Post holders involved in service re-design:

**60 %**

**Examples of impact on services:**

- ❖ Prompt discharge, streamlined services, improved continuity of care and improved access to care
- ❖ Enhanced MDT working
- ❖ Professional benefits to Radiography, career progression and education

**Examples of cost savings associated with roles:**

- ❖ Image reporting outsourcing reduction
- ❖ Refining radiotherapy techniques to improve capacity and efficiency
- ❖ Reduction in waiting times, avoiding expensive initiatives and financial breaches.
- ❖ Training others to deliver particular aspects of the service, improving capacity

Post holders evidencing they are working across 4 pillars of AP capabilities (HEE, 2017):

**66 %**

Post holders involved in service evaluation:

**84%**

**Post holders:**

**With a defined patient case load:**

**60 %**

**Influence Admission/Discharge:**

**41%**

**Administer medication/ HCPC annotated prescribers:**

**41%/28%**

**Patient plaudit:**

*“They are professional, energetically focused, caring and kind”*

## **Recommendations:**

- ❖ Collate multi-organisational data on the financial impact of advanced and consultant practice radiographer posts to quantify the value of these roles
- ❖ Review of medico-legal limitations to advanced practice to improve radiographer independent prescribing of medications
- ❖ Improvement in understanding of advanced and consultant level of practice: An increased awareness of advanced practice frameworks set out by NHSE WT&E and College of Radiographers is needed amongst service leads and advanced and consultant practice radiographers alongside pro-active job planning and specifications to enable four pillar working
- ❖ Improvements to employer specified educational requirements and job planning for A/CPRs and increased regional and national provision of training around supervision, leadership and management and patient assessment.
- ❖ Implement a network-wide approach to planning future posts to expedite advanced and consultant practice radiographer provision and alleviate local disparity in scopes of practice, job titles and banding
- ❖ Outcome measures for advanced and consultant practice radiographer roles need to be defined at a national and local level
- ❖ Encourage and increase involvement of advanced and consultant practice radiographers in extra-departmental research activity and dissemination both nationally and by service managers
- ❖ Increase advanced and consultant practice accreditation applications amongst the advanced and consultant practice radiographer workforce and impress the value of this upon service leads
- ❖ Collate a robust body of evidence on patient outcome and experience from advanced and consultant practice radiographer led services and interventions
- ❖ Improve inter-professional understanding of advanced and consultant practice radiographer roles to aid professional colleague support for role adoption
- ❖ Implement robust career pathways for advanced and consultant practice radiographers and improve provision of consultant practice radiographer roles aiming to retain the workforce
- ❖ Review of radiographer staffing numbers and increased provision of pre-registration training
- ❖ Higher Education Institutions (HEIs) to increase involvement of advanced and consultant practice radiographers in Level 6 and Level 7 curriculum design and delivery

## Glossary and list of abbreviations

<b>Term/ Abbreviation</b>	<b>Meaning</b>
NHSE	National Health Service England
NHSE WT&E SE	National Health Service England Workforce, Training and Education, South East Region
APR	Advanced Practice Radiographer
CPR	Consultant Practice Radiographer
AP	Advanced Level Practice
CP	Consultant Level Practice
DR	Diagnostic Radiography
RT	Radiotherapy
SE	South East Region, UK
US	Ultrasound
IR	Interventional Radiology
CT	Computed Tomography
PGD	Patient Group Directions
NMP	Non-medical prescribing
ACP	Advanced Clinical Practitioner
HPCP	The Health and Care Professions Council
CoR	College of Radiographers
SoR	Society of Radiographers

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## Background and Introduction

NHSE WT&E South East approved a proposal and funding for AECC University College to undertake a scoping project to ascertain how advanced and consultant practice across the south east region is being utilised within Radiography. This report aims to capture where advanced and consultant practice roles in Radiography are currently operating and how these roles have impacted services within the region. In addition, information on the future of these roles is reported upon and what practitioner and organisational visions there are for maintaining, sustaining and growing these further.

The value of advanced practitioners and consultant practitioners is considered as crucial to supporting timely care for patients (NHSE, 2020) (NHSE, 2021). They have been identified as key roles for expansion by NHSE in the NHS Long Term Workforce Plan to train, retain and reform the workforce (NHSE, 2023). NHSE plan for over 3,000 clinicians to start advanced practice pathways annually from 2023/24, tailored to support service demand. This will increase by 46% to 5,000 by 2028/29 so that 6,300 clinicians will start advanced practice pathways each year by 2031/32.

The Report of the Independent Review of Diagnostic Services for NHS England stipulates that the expansion of diagnostic radiography services must start as soon as possible. In addition, new service delivery models are urgently needed to ensure safe pathways to diagnosis for patients to drive efficiency in service delivery (NHSE, 2020). With a focus on cancer, we are in a time of unprecedented advances in the ability to prevent, diagnose and treat cancer, and there is a need to embed proven new treatments and tests in healthcare as quickly and equitably as possible in local areas via Cancer Alliances (NHSE, 2019). Skill mix and new roles at advanced and consultant levels of practice for therapeutic radiographers have been highlighted as key to improving access to innovative and advanced radiotherapy treatments (SoR, 2023).

The future of the imaging and radiotherapy workforce with the advent of community diagnostic centres, increased pressure on cancer targets with poor medical and non-medical staff attrition and recruitment, relies on continuing to develop advanced and consultant levels of practice within Radiography, Radiotherapy and Sonography. Significant investments are being made in technology and equipment to ensure all patients have access to the latest treatment and to accelerate rapid diagnosis and assessment of patients to enhance their quality of life. However, patients will not benefit from such developments unless sufficient staff with the right skills and support are there to deliver them. The advanced and consultant radiographer workforce can focus on leading new service models and innovations, exploring how technology and innovative practice can help to improve delivery.

Thus, there is an impetus for scoping advanced and consultant practice in Radiography and the related workforce to evaluate the impact they are having, in light of achieving the ambitious targets that the investments made expect to meet. In order to move forward with recruitment and retention targets, this project critically



reviews and evaluates how these roles are being utilised in current practice and identifies enablers and barriers in developing these roles within organisations and within the NHSE WT&E South East region. It is hoped that this piece of work will promote advanced and consultant practice within Radiography and aid service managers to understand the impact of advanced and consultant practice within diagnostic and therapeutic Radiography and aid in their decision-making processes when creating workforce plans.

## Aims

1. To identify how advanced and consultant practice has impacted the workforce and service delivery
2. To gain an insight into the patient experience of advanced and consultant practice within Radiography
3. To identify the potential financial impact of advanced and consultant practice within Radiography

## Methodology

A mixed methods study was conducted using quantitative and qualitative data using the following methods:

1. A literature review was conducted using the following search terms found in Appendix 1. Appendix 2 shows the Prisma diagram of the collated studies. A summary of findings of the primary studies reviewed was tabulated and can be found in Appendix 3.
2. A questionnaire was designed and distributed to individual advanced and consultant practice radiographers across the NHSE WT&E SE region. Results were analysed and descriptive statistics were generated using Microsoft Excel™ and Microsoft SPSS™.
3. A questionnaire was designed and distributed to service managers working at organisations across the NHSE WT&E SE region. Results were analysed and descriptive statistics were generated using Microsoft Excel™ and Microsoft SPSS™.
4. Semi-structured interviews were conducted with advanced and consultant practitioner radiographer volunteers who completed the practitioner questionnaire. Appendix 4 shows a list of the topics discussed. Full verbatim was independently transcribed and analysed thematically using NVivo v1.5.2™.
5. Participants were asked to provide plaudits from patients with direct reference to advanced and consultant practice radiographers who have been involved in their care and treatment which were analysed thematically.
6. All data analysis was peer reviewed by a multi-professional team.

## Governance

Governance for the project was carried out via regular meetings and reporting to the project sponsor at NHSE WT&E SE.

## Limitations and Risks

This project was limited to the Therapeutic and Diagnostic Radiography workforce within the SE region only. With service demands and time constraints it was difficult to allocate time to participating in this project. Therefore, there was a risk of a lack of respondents. Every effort was made to obtain a representative sample size of the region by extending response deadlines appropriately and sending regular reminders.

# Chapter 1: Picture of South East Region Advanced and Consultant Practice Radiographer Workforce

## Participants

There were 14 respondents to the service leads questionnaire and 32 respondents to the AP radiographer questionnaire. Nine of the service leads were from diagnostic radiography departments and five were from therapeutic radiography departments. Respondents worked throughout the SE region as illustrated by figure 1. 9. Nine respondents did not specify their organisation name. The majority of respondents (20) were from Hampshire.

**Figure 1: Map of region and number of respondents**

### Service Lead Questionnaire:



### Practitioner Questionnaire:



## Number of A/CPRs and Job Titles

Two of the service leads specified that they did not have APRs in their centre and seven centres did not have CPRs, four of which had just one CPR post. The remaining centres had the following numbers of APRs and CPRs:

Level of Practice	Mean	Sum	Range (min-max)
AP	6.64	80	1-20
CP	1.86	13	1-4

The majority of these posts (52) were in diagnostic departments and 28 were in radiotherapy departments. Eight CPRs worked in DR departments and five CPRs worked in RT departments. The practitioner questionnaire had a higher proportion of respondents from an RT background; 17 APRs had a base profession of DR and 15 had a base profession of RT, three of the four CPRs worked in RT.

22 of the post holders worked full time and ten worked part time, equating to 1085 hours worked in total each week by this cohort with a mean of 33.9 hours per week.

Hours worked per week ranged from 7.5 hours and 37.5 hours. The respondent at 7.5 hours worked in a university setting for three days a week.

Indicative job titles for these posts generated from the responses to the practitioner questionnaire are:

<b>Level of practice</b>	<b>Diagnostic</b>	<b>Therapeutic</b>
<b>Advanced</b>	<ul style="list-style-type: none"> <li>• Advanced GI Practitioner &amp; Reporting Radiographer</li> <li>• Advanced Practitioner</li> <li>• Advanced Practitioner Radiographer</li> <li>• Advanced GI Practitioner</li> <li>• Radiographer Advanced Practitioner</li> <li>• Radiographer Advanced Practitioner</li> <li>• ACP in Nuclear Medicine Therapies</li> <li>• Advanced Practice CT Head Reporting Radiographer</li> <li>• Advanced Clinical Practitioner Radiographer</li> </ul>	<ul style="list-style-type: none"> <li>• Patient Pathway and Treatment Preparation Advanced Practitioner</li> <li>• Advanced Therapeutic Radiographer in Lower GI Cancer</li> <li>• ACP Palliative Radiotherapy</li> <li>• Advanced Practitioner Imaging Therapy Radiographer</li> <li>• Urology Advanced Practitioner</li> <li>• SRS &amp; Neuro Advanced Practitioner</li> </ul>
<b>Consultant</b>	<ul style="list-style-type: none"> <li>• Consultant Radiographer</li> </ul>	<ul style="list-style-type: none"> <li>• Consultant Therapeutic Radiographer Breast Specialist</li> <li>• Consultant Therapeutic Radiographer Neuro Oncology</li> <li>• Consultant Radiographer</li> </ul>
<b>Trainee</b>		<ul style="list-style-type: none"> <li>• SABR Lead Advanced Practitioner (ACP in training)</li> <li>• Trainee Advanced Clinical Practitioner</li> <li>• Breast Consultant Radiographer (Trainee)</li> </ul>
<b>Unspecified</b>	<ul style="list-style-type: none"> <li>• Clinical Specialist Sonographer</li> <li>• Gastrointestinal Radiographer</li> <li>• Reporting Radiographer</li> <li>• Paediatric Sonographer, Deputy Superintendent</li> <li>• Senior CT Radiographer/ Quality Improvement Lead</li> <li>• Radiology Education Lead</li> <li>• Lead Reporting Radiographer</li> </ul>	<ul style="list-style-type: none"> <li>• Technical Lead Radiographer</li> <li>• Clinical IT Lead Radiographer</li> <li>• Radiotherapy Technical Lead</li> </ul>

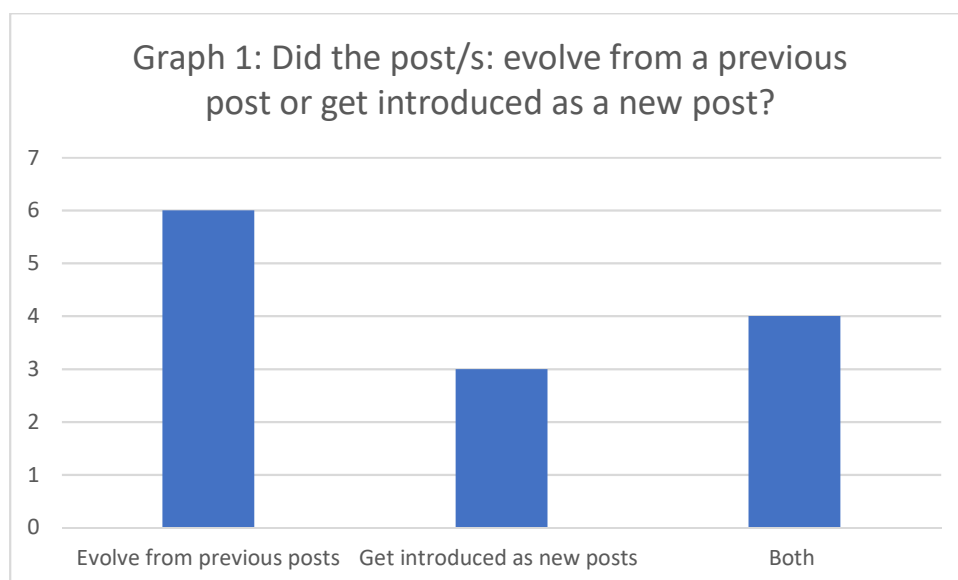
16 respondents had a job title that identified them as an APR, five as a CPR and 11 had job titles that did not specify their level of practice. One of the CPRs and two of the APRs had trainee in their job title, all of which had a base profession of RT. Of note, one of the respondents worked outside of their base profession at a Community Frailty Service, all others worked within their base professions at an NHS Trust.

## Experience and role development

Service leads indicated that APR and CPR posts have existed for a mean of eight years, ranging from 0.5 to 18 years. Similarly, APRs and CPRs indicated a similar length of time that they had been post with a mean of 5.7 years, ranging from one to 21 years.

APRs and CPRs began their current posts between 1.5 to 32 years post their initial registration with a mean of 11.7 years. The length of time the post holders thought their advanced practice career pathway started was similar, ranging from 2.5 to 24 years with a mean of 9.22 years. Two respondents specified that they starting preparing for the role when in post.

Most service leads indicated that the posts evolved from previous posts (n=6) and four respondents indicated a combination of evolving from previous posts and introducing as new posts in their centre. Only three centres specified solely creating A/CPR posts as new as illustrated in graph 1:



A/CPR's also indicated organic growth of their roles, an example of which is as follows:

'It was started ~16 years ago due to unmet demand for barium enemas - radiographers were trained to perform these exams. This was later expanded into reporting barium swallows and the role has gradually developed from there'

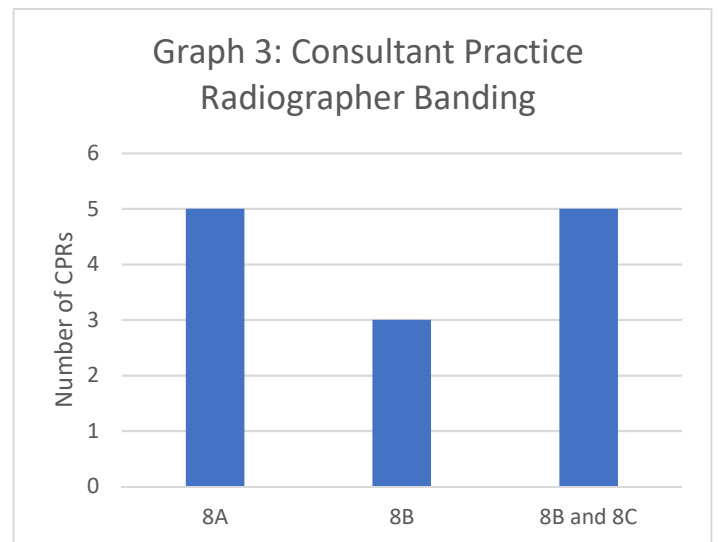
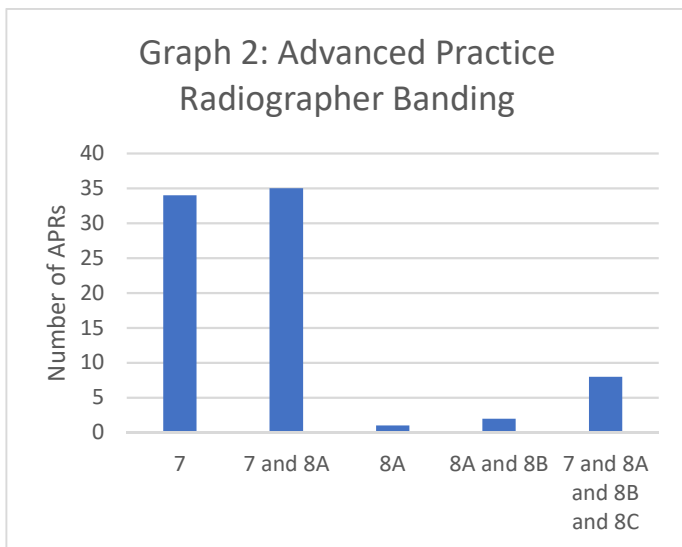
Interviewees expressed similar sentiments to the questionnaire findings with the following theme:

**‘My job doesn’t look like a radiographer’s job’ – The new and unknown roles of advanced and consultant practice in radiography**

All participants expressed their career development and roles in advanced practice. Their individual journeys into advanced practice varied tremendously, with different roles, responsibilities, and career aspirations. It was highlighted that their roles had evolved over time: “I do forget, actually, that it’s quite cutting edge and there’s not many people doing this and certainly there’s no one else like me” (Participant 3). The interviewees all felt that their roles had significantly expanded outside of radiography since working as an A/CPR. They highlighted working outside of their scope as radiographers.

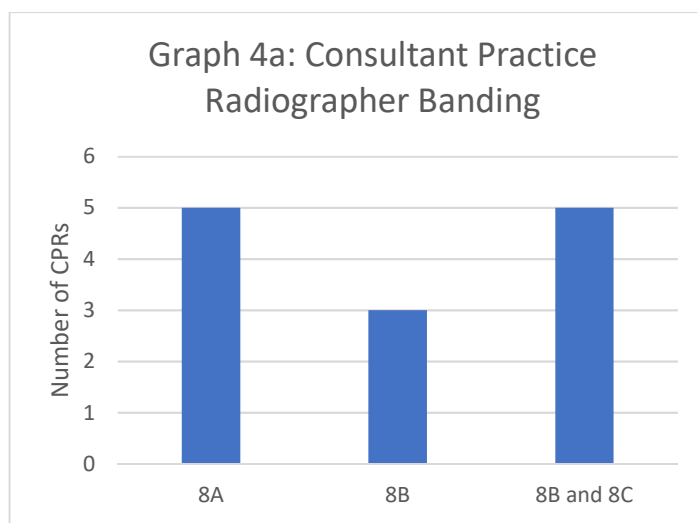
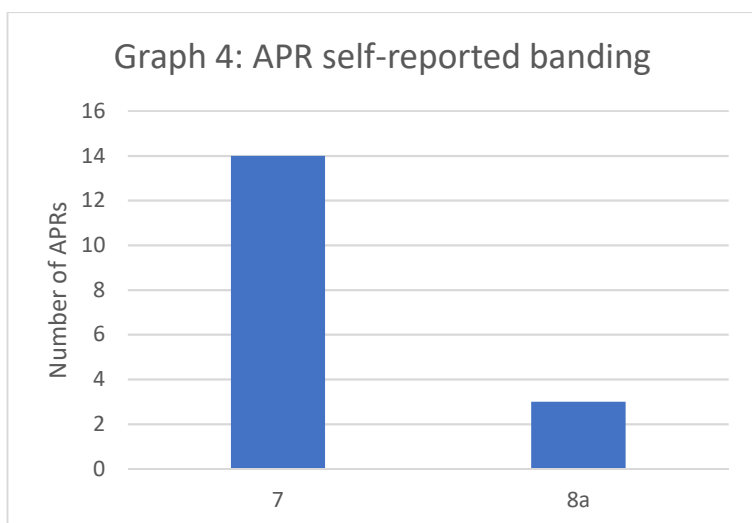
**Banding**

A range of agenda for change bandings (NHS, 2004) was specified by the service leads for APR posts which mostly fell at a Band 7 level; with 35 at band 7 and 8A and 34 at band 7. CPR post banding ranged from 8A to 8C as illustrated by graphs 2 and 3:



APRs and CPRs self-reported banding range was the same as that of the service leads; from band 7 to 8B with the majority of post holders (20) at a band 7 level. APR posts were all banded at 7 and 8a with majority (14) respondents were band 7, and three were band 8A. Similarly, six of the unspecified posts were at band 7 and 4 were at band 8A. This is illustrated in graphs 4 and 4a. One trainee APR specified that they will progress to a Band 8A on completion of their training. Consultant posts were all at band 8. The trainee consultant post was at band 8A, as well as two other

non-trainee posts, one post did not specify the exact pay point and one post was at 8B.



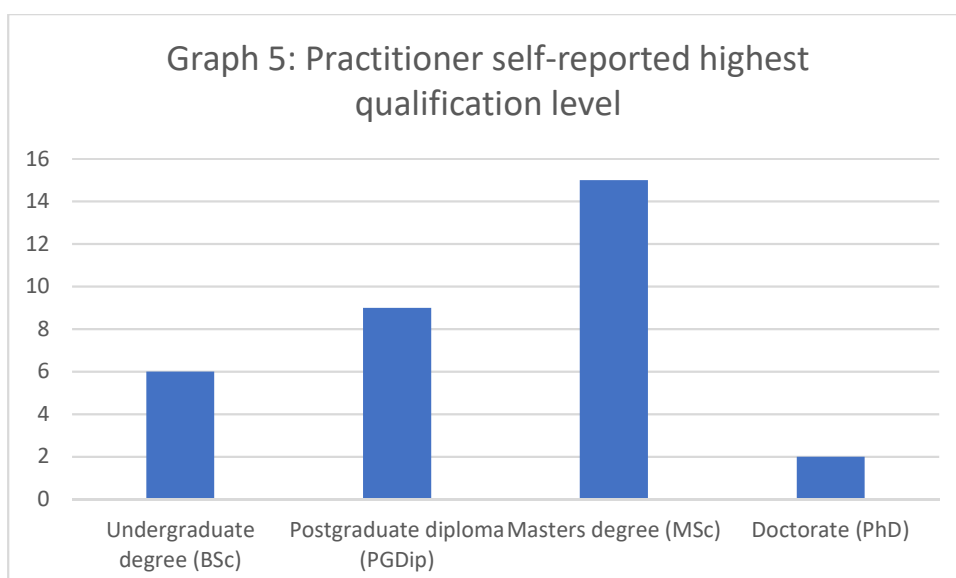
One service lead commented on banding discrepancy and the difficulties in addressing this:

*‘Many staff across the NHS will be at ACP level but not have banding or JD to reflect that. This is what I am currently facing with my lead x-ray reporter. She should be an 8A but most trusts require a full business case to get this approved’*

## Education Pathways

### Qualifications

The majority (15) of respondents had a Master’s degree (MSc), nine had a Postgraduate Diploma, six had an undergraduate qualification (BSc) and two had a Doctorate (PhD). The highest-level qualification held by respondents is shown in graph 5 below. Five of the six respondents with a BSc all held either level 7 post-registration modules or a Post-graduate Certificate. One of the respondents that held a PhD was a CPR and one did not have a specified level of practice in their job title. Four of the CPRs had a full MSc and one had a BSc plus additional MSc modules.



12 service leads stated that training and education was considered and funded in relation to introducing APR and CPR posts. Respondents that gave further details on the education pathway for the post holder/s or the intended pathway for any new post holder/s all specified post-graduate qualifications ranging from a Postgraduate Certificate to a full MSc and in three cases award titles were not specified.

Details of the awards held by respondents are shown in the following table. The most frequently held award (6 of the 28 responses) held MSc's in Advancing Practice, five of these had a base profession of Therapeutic Radiography. 14 of the 28 responses were all awarded in the last five years:

<b>Title of awards / module/s achieved</b>	<b>Date Achieved:</b>
Details Not Specified	2003
MBSImP Video Swallow Reporting	2021
MSc Advanced Clinical Practice	2023
MSc Advanced Clinical Practice	2023
MSc Advanced Clinical Practice	-
MSc Advanced Practice	2023
MSc Advancing Practice	2022
MSc Advancing Professional Practice	2021
MSc Clinical Reporting	2012
MSc Health Economics and Policy	2023
MSC Health Sciences	2023
MSc in Genetics of Human Disease	2011
MSc in Social Research, Management of Patients Undergoing Palliative Radiotherapy	2004, 2008
MSc Management in Social Care	2009
MSc Medical Imaging Mammography	2017
MSc Radiotherapy Planning	2020
MSc Supportive and Palliative Care	2014
MSc Ultrasound (general medical), PhD Ultrasound (research)	2016, 2023

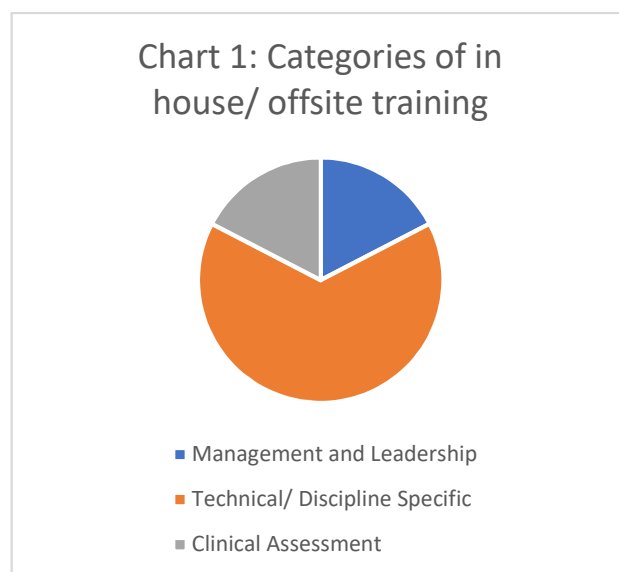
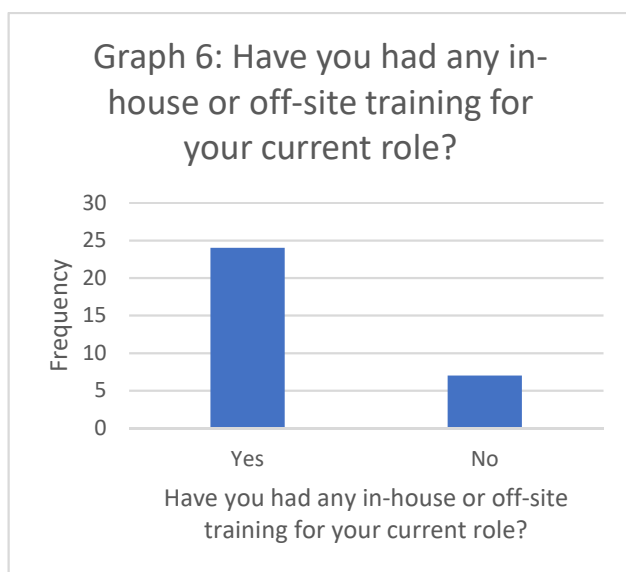


PgCert Adult Chest Plain Film Reporting with Abdominal Reporting, PgCert Axial and Appendicular MSK plain film reporting	-
PgCert Advanced Medical Imaging	2022
PgCert Appendicular Reporting	-
PgCert Barium Enemas, PgCert Assessment of Swallowing Disorders, PgCert Advanced Medical Imaging	2006, 2009, 2018
PgCert Clinical Reporting (Adult Chest)	2018
PGCert Diagnostic Ultrasound and Abdominal Ultrasound	2004
PgDip CT	2022
PgDip Medical Imaging	2011
PgDip Skeletal reporting, PgCert Chest and Abdo Reporting	2012, 2015
Radionuclide Imaging	2006

All interviewees had completed or were close to completing an MSc in Advanced Clinical Practice. However, on top of this they had sought out additional training needs and learning opportunities, for example to develop leadership skills or other clinical skills.

### Training

The majority of respondents (24) had in house or offsite training for their current role. These trainings largely fell into three categories; Management and Leadership (4), Clinical Assessment (5), the majority of which (15) were Technical/ Discipline Specific as illustrated by chart 1.



Eight respondents are currently studying educational courses or academic qualifications. Similarly to the results for awarded academic qualifications, the majority (6 of 10 responses) are in Advancing Practice, four of these responses are therapeutic radiographers. Service leads corroborated this finding with one service lead specifying the HEE advanced practice pathway.

Title of awards / module/s currently studying
Clinical Breast Examination
Doctorate in Health

MSc (unspecified)
MSc Advanced Clinical Practice
MSc Advanced Clinical Practice
MSc Advanced Clinical Practice
MSc Advanced Clinical Practice
MSc Advanced Medical Imaging

One identified theme indicated challenges around getting appropriate training for A/CPRs with one service lead commenting:

*‘Once qualified are very good but can be hard to get the support needed to qualify’*

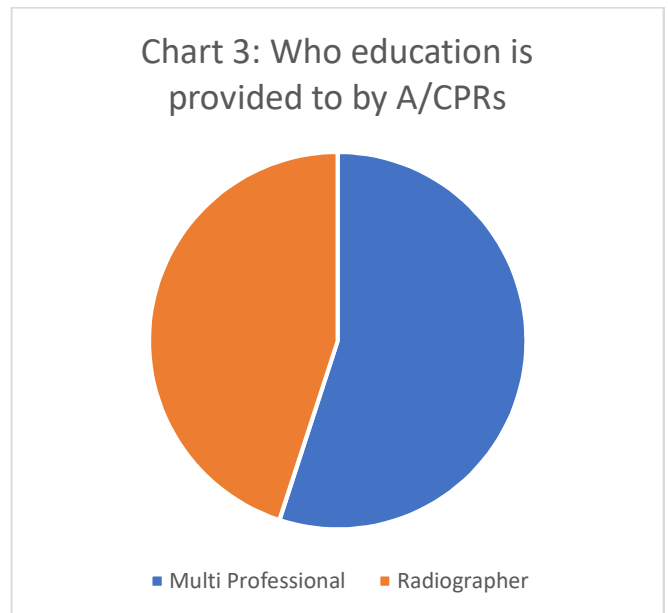
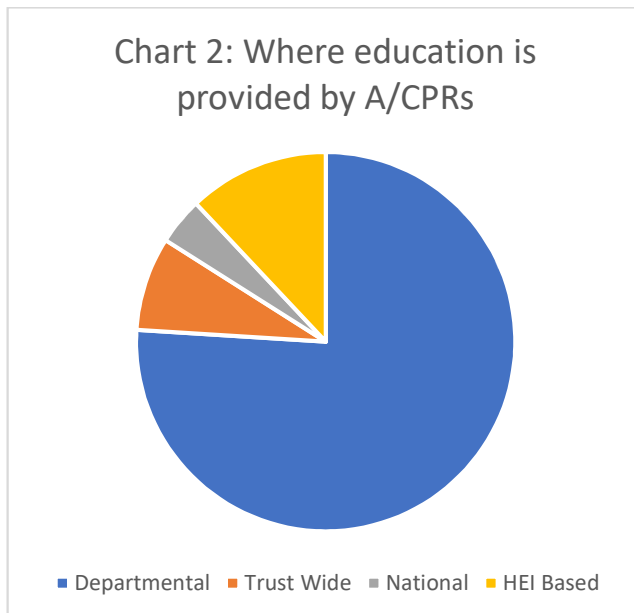
A/CPRs self-reported limitations around their training:

*‘Would like to have more time to spend training & assisting with clinical imaging & advanced techniques’*

*‘Need more time for research and audit with more CPD and teaching available for staff’*

### Education Provision

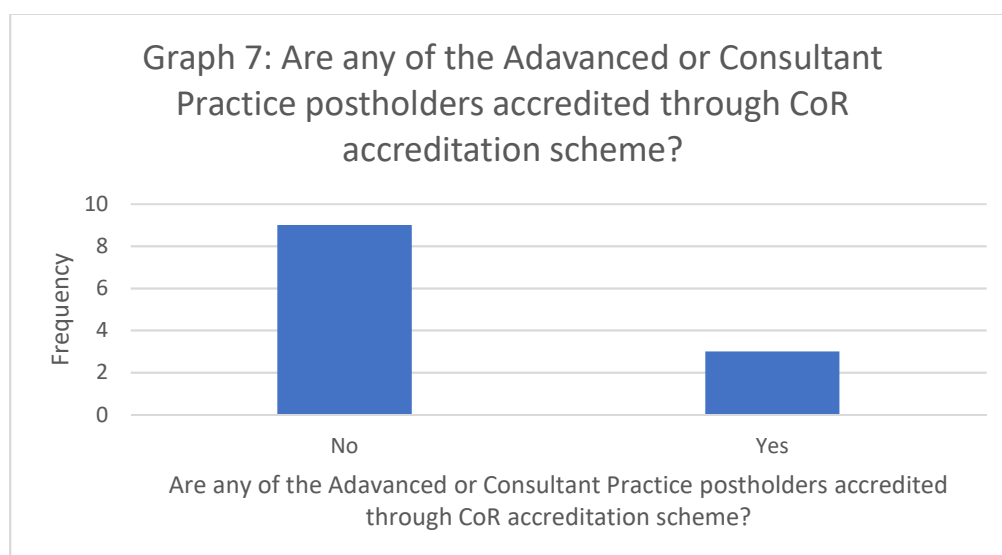
All respondents were involved in the education of other staff members. Education was most commonly departmental (19) with fewer providing education outside of their department; trust wide (2), national (1) or HEI based (3). Where specified; education was largely given multi-professionally (11) and in some cases just to radiographers (9). Other professions mentioned were mainly Medical Doctors with one respondent educating Health Care Assistants.



## Accreditation

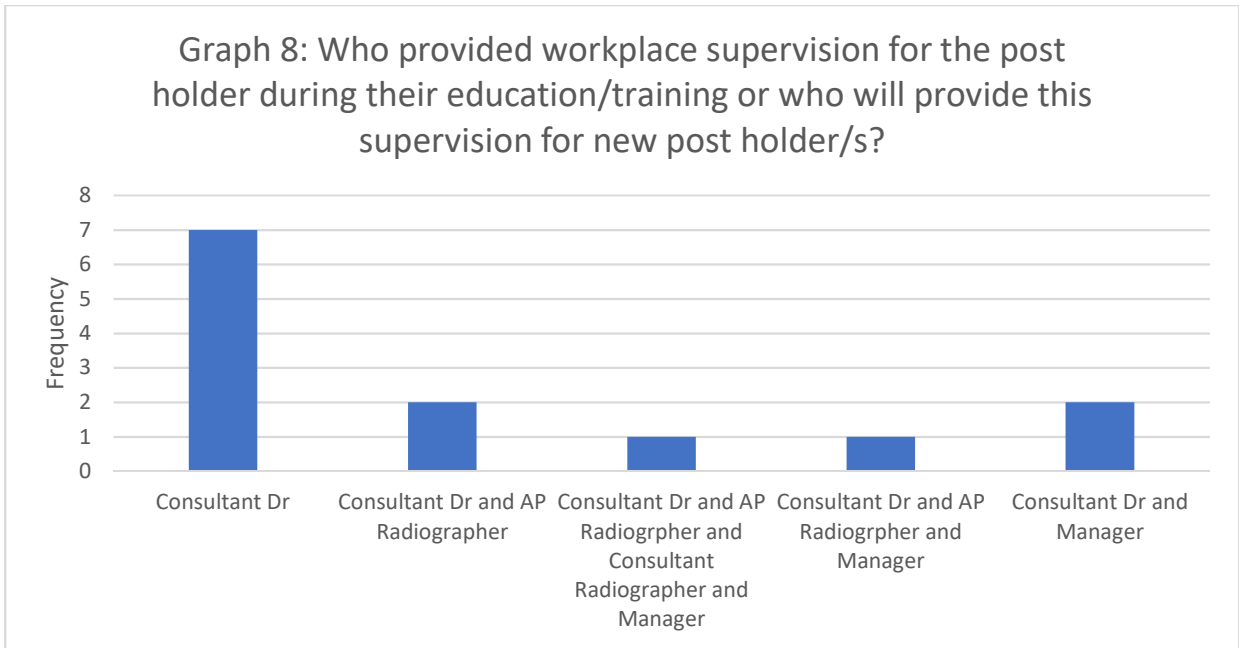
Many respondents (12) held or are studying for MSc's pertaining to advanced practice. If these were Centre for Advancing Practice accredited programmes, APRs and CPRs may therefore have recognition of the quality assurance of their advancing practice education, training, and experience via a digital badge (NHS HEE, 2023). Two are undergoing the NHSE Centre for Advancing Practice e portfolio (supported) route, which will give them advanced practice recognition of an AP digital badge (NHS HEE, 2023). College of Radiographers advanced or consultant practice accreditation is uncommon amongst the post holders (SoR, 2022). Only one APR had advanced practitioner College of Radiographers accreditation since 2017 and one CPR had been accredited as a consultant radiographer since 2020. Time (n=13), renewal cycle (n=1), accreditation not being mandatory (n=1), a perception of nothing to gain (n=4) and not being registered with CoR (n=3) were cited as reasons for not applying.

Nine out of 14 service leads responded that APRs and CPRs in their team have not been accredited as shown in graph 7.



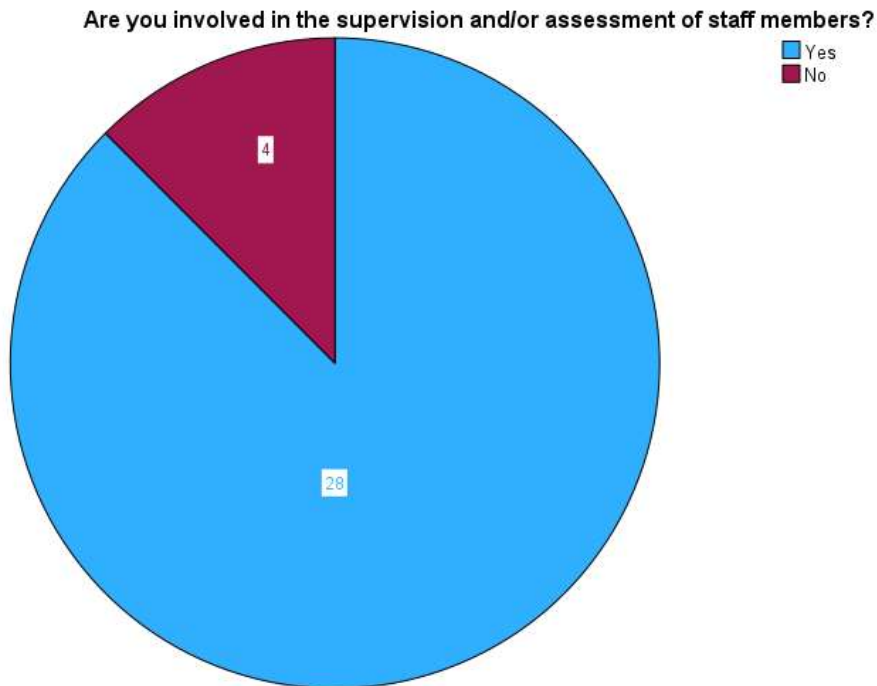
## Workplace Supervision

Service Leads indicated that workplace supervision for the new APR or CPR post holders during their education/training was or will be provided by Consultant Radiologists or Clinical Oncologists in every case alongside APRs or CPRs and managers in some cases as shown in graph 8.



The majority of APRs and CPRs (28) acted as supervisors themselves, including four out of five CPRs. 5 respondents detailed that they supervised and assessed staff members of other professions, seven that they supervised radiographers and 13 did not specify who they supervised. One APR provided supervision of radiographers undertaking clinical examinations as part of a post-graduate training programme.

Chart 4:



Advanced skills/role activities performed as part of role

A plethora of examples were given across each pillar of advanced practice with 29 A/CPRs giving responses to the question; 'What advanced skills/role activities do you use as part of your role? (highlight 3 main points under each heading)'. Three of the responses given could not be mapped against the AP capabilities set out in the HEE Multi-professional framework for advanced clinical practice (NHS HEE 2017). The remaining 26 responses are tabulated below and mapped against the capabilities. 5 did not provide examples but stated which capabilities they are working against, these are highlighted in red. The remaining 21 were mapped against the capabilities by the report authors.

Eight respondents could not provide examples across all four pillars. One respondent explicitly stated they were currently not covering the research pillar and one stated they were not covering the leadership and line management pillar, the remaining six were assessed as not aligning with the defined advanced level of practice in the NHS HEE framework. The numbers that couldn't give examples in one category are as follows; leadership and management (3), clinical (2), research (1). The numbers that couldn't give examples across two categories are as follows; clinical and research (1), leadership and management and research (1). It therefore can't be deduced from the quantitative data which pillar it is most difficult for A/CPRs to cover.

An emergent theme from qualitative interview analysis is as follows:

**'It was, you know, probably 80% clinical' – Roles and responsibilities within the 'other' pillars**

Interviewees reflected on all four pillars of advanced practice. Participants identified a need for dedicated time to carry out the role, especially considering activities outside of the clinical pillar: "you're always putting out fires, you know. You know, if you're short staffed, you end up doing things, you know, if that's your day for sitting at a desk and then you're short staffed, you end up not on your desk cause you've got to do something else" (Participant 3).

Although all pillars were seen as important, research, leadership and education were seen in addition to clinical work. Participants of the qualitative component highlighted the need to work across all four areas, for example Participant 3 noted the need to show work outside of their clinical expertise in regards to their advanced practice portfolio: "hopefully I've evidenced enough within that [portfolio] to say that I cover the four pillars" (Participant 3).

Participants all identified their own limitations in regards to the four pillars "I feel like it is the weakest element of my skill set. I am very much a clinical person" (Participant 1). However, their "weakest" skill varied among the participants "I would say probably my weakest pillar is research and I certainly feel that that's something that I need to work on and sit down and do more for" (Participant 3).

There was a variety of activities to support the other pillars. For example, within the education pillar, participants had roles including lecturing in higher education, mentoring in practice, and providing in-house training and support. Research was seen as a variety of activities varying from service evaluation, clinical audits, to more traditional research trials. For one participant research was seen as a key area for career development "I'm trying to build research into my world to buy my training day off the department and make it a research day" (Participant 1).

Each questionnaire response was further mapped against the educational background of the A/CPR. Of the eight responses that were not working across all 4 pillars, 3 held an MSc, 3 held a PGDip and 2 held a BSc. Of the three excluded responses that could not be mapped against the standards; 2 held a PgDip and one held BSc. This indicates that level 7 study consisting of a full MSc enables practitioners to work across the four pillars. Out of the three respondents that held an MSc; 2 had an MSc in discipline specific courses and one held an MSc in Advanced Professional Practice. As titles of Advanced Clinical Practice programmes have not until recently been standardised, it is difficult to ascertain whether the contents of the MSc Advanced Professional Practice align with the Multi-professional framework for advanced practice (NHS HEE, 2017).

Service leads were also asked to give three examples of how A/CPR's within their services worked across the four pillars. 11 service leads gave examples across all

four pillars. The examples given were written at a high level compared to the A/CPR responses therefore the detail could not be assessed and mapped against the capabilities. However, they mirrored the outcomes of the practitioner responses; two responses indicated that their team members were not working in research and one only gave clinical examples. One service lead explicitly stated the challenges around four pillar working and the education required to do this:

*'Clinical demand is overwhelming leaving little scope for the other pillars. HEI courses are becoming limited, especially US and most learning is pushed onto already overstretched clinical teams through the so-called negotiated learning modules'*

Of note only two service leads indicated A/CPR involvement with HEIs and six A/CPRs themselves said they were working with HEIs, one stated it was at an undergraduate level.

**Table to show mapping of examples of working across the 4 pillars against HEE Multi Professional Framework capabilities and educational background**

Standard	Respondents																									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1.1		X	X	X	X	X			X		X	X				X					X	X			X	X
1.2											X								X							
1.3											X								X			X				X
1.4				X						X	X		X		X					X						
1.5											X					X										
1.6	X									X	X		X		X					X		X				X
1.7	X		X	X	X					X					X											
1.8											X		X												X	
1.9	X	X						X			X		X		X	X										
1.10	X										X		X													
1.11											X								X	X						
2.1											X								X			X				X
2.2	X										X		X						X		X					X
2.3	X										X								X		X					
2.4												X								X		X				
2.5				X	X						X				X			X					X			X
2.6											X															
2.7	X										X									X						
2.8			X			X	X	X		X	X	X		X		X						X				
2.9	X			X	X		X				X				X	X			X	X	X			X		
2.10											X		X													
2.11											X															
3.1	X	X			X						X		X						X			X				X
3.2								X	X		X	X	X						X	X						X
3.3			X	X		X				X	X				X	X	X	X			X		X			X
3.4			X				X			X	X	X	X	X	X	X			X	X		X				
3.5	X		X								X		X									X				
3.6											X		X	X						X				X	X	
3.7	X			X	X			X		X	X										X					
3.8											X															
4.1	X	X	X	X						X					X		X			X						
4.2	X		X	X	X			X		X			X	X		X	X				X	X				X
4.3						X		X					X									X		X		X
4.4																										
4.5										X											X					
4.6					X						X											X				X
4.7	X					X			X			X	X		X		X				X					
4.8							X				X					X										
4P	Y	N	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	N	Y	N	Y
Ed*	M	B	P	M	M	M	M	M	M	M	M	M	M	M	M	P	D	D	B	M	D	D	M	B	D	B

**Key:** 4P= Working across all four pillars: Y (Yes) or N (No)

Ed= Educational background: P (PhD)/ M (MSc)/ D (PgDip)/ B (BSc)

Red text: Examples not provided and respondent stated which capabilities they are working against



To show case advanced and consultant practice working across all four pillars the below table gives examples of roles where duties could be clearly mapped against the Multi-professional framework for advanced and consultant practice: four are self-reported by the A/CPR and two are given by service leads of A/CPRs working within their teams. All four examples held MSc's with the Clinical Specialist Radiographer holding a PhD and working at a consultant level of practice.

<b>Job title</b>	<b>Clinical:</b>	<b>Leadership/ Management:</b>	<b>Education:</b>	<b>Research:</b>
Gastro-intestinal Radiographer  Fluoroscopy and CTC	<p>Performing and reporting fluoroscopy examinations - adapting the technique depending on the patient and pathology that arises.</p> <p>Collaborating with pharmacy - writing PGD for Buscopan and Gastrografin</p> <p>Communicate with the ward doctors to advise on appropriate techniques for the patients and communicating urgent results to them. 1.9</p> <p>CT colonography patients- liaising with endoscopy for same</p>	<p>Written guidelines to improve and expand current fluoroscopic techniques to broaden expertise and help with service need.</p> <p>Support more junior colleagues with reassurance and guidance through complex studies and how to overcome them.</p> <p>Perform self audits with peer review to evaluate and improve own technique/reporting and share with colleagues for shared learning.</p> <p>Changed video fluoroscopic service within the trust to</p>	<p>Teaching radiology registrars the fluoroscopy technique and relevant pathology within a tight timescale. Appraise their techniques and give them goals for their next lists.</p> <p>Teach more junior GI colleagues in all fluoroscopic studies to improve their technique and independence for a more robust service</p> <p>Go on relevant courses, read relevant and up to date articles and encourage other GI colleagues to read articles and go on</p>	<p>Involved with minimal prep CT colon effectiveness research study.</p> <p>Audited PGD Buscopan® use across the Trust and critically evaluated the results to improve and update new PGD with pharmacy</p> <p>Communicating with fellow colleagues with certain specialities to encourage further use of Buscopan® within a safe setting - more user friendly.</p> <p>Perform CPD lecture to broaden understanding of the CTC service and</p>

	day CTC scans when appropriate if cancer is found. Performing staging scans to speed up pathway	enable a more robust service and reporting structure liaising closely and engaging with speech and language therapists.	courses to improve technique.	reason why good technique is important.
Technical Lead Radiographer Radiotherapy	<p>Leading the introduction of new techniques such as SABR and SGRT</p> <p>Trouble shooting complex treatment deliveries and imaging</p> <p>Refining existing processes to improve efficiency and decrease cancer waiting times</p>	<p>Line managing a group of AdP radiographers and leading towards departmental goals</p> <p>Defining a technical vision and leading the department towards this</p> <p>Promoting the Radiography profession at Trust and national events</p>	<p>Designing education programs when new techniques are introduced</p> <p>Presenting at national and international forums to share learning</p> <p>Contributing towards national guidelines for IGRT and SABR</p>	<p>Conducting work-based learning projects such as audits</p> <p>Publishing material in peer-reviewed journals, poster presentations at conferences</p> <p>Collaborating with the Clinical Trials team to deliver national and international radiotherapy trials</p>
ACP Palliative Radiographer Radiotherapy	<p>Assessing patients at all stages of cancer pathway</p> <p>Developing patient centred management plans</p> <p>Providing continuity of care</p>	<p>Proactively initiating and developing change</p> <p>Actively lead new practice and service design</p> <p>Critically and strategically apply advanced clinical expertise</p>	<p>Deliver effective teaching and training to medical students, junior doctors and other HCPs</p> <p>Supervising trainees</p> <p>Acting as clinical supervisor</p> <p>Teaching at academic institutions</p>	<p>Participate in research</p> <p>Understands the role of evidence in clinical practice awareness of GCP principles</p>

	<p>Effective management of disease, managing oncological emergencies</p> <p>Independent prescribing</p>			
<p>Clinical Specialist Radiographer</p> <p>Ultrasound</p>	<p>Work as an unsupervised clinical practitioner, to provide GI imaging examinations within an agreed scope of practice</p> <p>Provide specialised GI imaging advice to specialties providing patient care</p> <p>Participate in GI MDTs</p>	<p>Clinical lead for general ultrasound department</p> <p>Responsible for evaluating service and identify areas for improvement</p> <p>Develop protocols and techniques in line with current practice.</p> <p>Involvement in recruitment and role development within the ultrasound department</p>	<p>Lead in the CPD of all ultrasound/GI radiographer staff members and participate in the delivery of CPD programmes</p> <p>Provides specialist US and GI US teaching to staff</p> <p>Work in conjunction with Higher Education Institutions to deliver training to staff from other organisations.</p>	<p>Lead for research and audit within the imaging department (ultrasound)</p> <p>Developing new research and audit projects in areas of specialist interest.</p> <p>Present research findings to large and wide-ranging staff groups, imparting knowledge, with the ability to answer complex and probing questions about the topic</p> <p>Working within and outside the organisation, to secure funding for any research and development</p>

<p>Radiotherapy Service Lead- overview of A/CPR's within service</p>	<p>Continuity of care for cancer patients</p> <p>Effective management of the disease</p> <p>Assessing patients at all stages of cancer pathway</p> <p>Formulating patient centred management plan</p> <p>Managing oncological emergencies</p> <p>Independent prescribing</p>	<p>Providing a strategic leadership</p> <p>Initiate and develop new roles</p> <p>Lead new practice and service redesign</p> <p>Actively lead in developing practice</p> <p>Strategically apply ACP expertise</p>	<p>Deliver effective teaching and training to medical students, junior doctors and other HCPs</p>	<p>Actively involved in various methods of research within oncology</p>
<p>Radiology Service Lead- overview of A/CPR's within service</p>	<p>Aseptic and sterile interventional procedures</p> <p>Cardiac stressing</p> <p>Ultrasound guided procedures</p> <p>Lumbar punctures</p> <p>GI procedures</p> <p>Breast biopsies and film reading</p>	<p>Radiology ACP group, trust ACP assurance group</p> <p>Senior management meeting</p> <p>Engagements with internal and external stakeholders. team leading</p>	<p>Clinical governance talks</p> <p>Teaching of all grades</p> <p>Posters and audits, conferences</p> <p>Engagement with local universities</p>	<p>Posters</p> <p>Audit</p> <p>Service redesign</p> <p>Research topics</p>

## Chapter 2: Service Impact of Advanced and Consultant Practice Radiographer Workforce in the South East Region

Chart 5:

Have you initiated, led, been involved in research / audits / evaluations of your service?

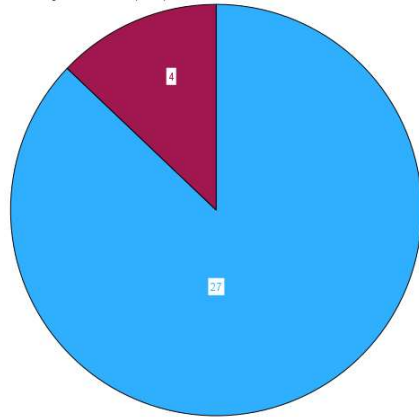


Chart 6:

Have you been involved with implementing and monitoring protocols/guidelines?

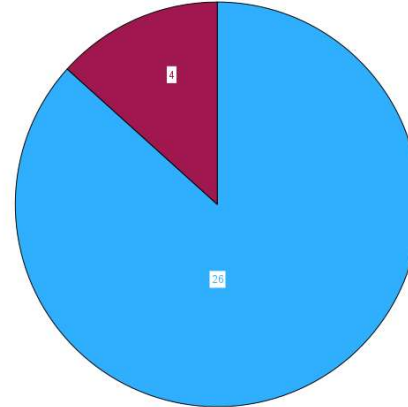
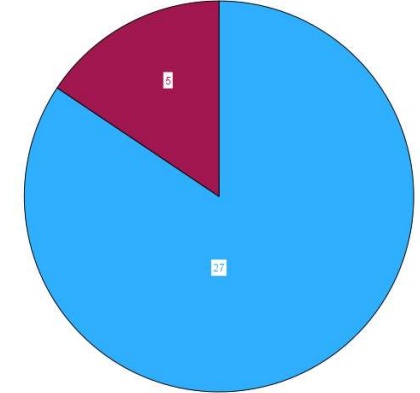
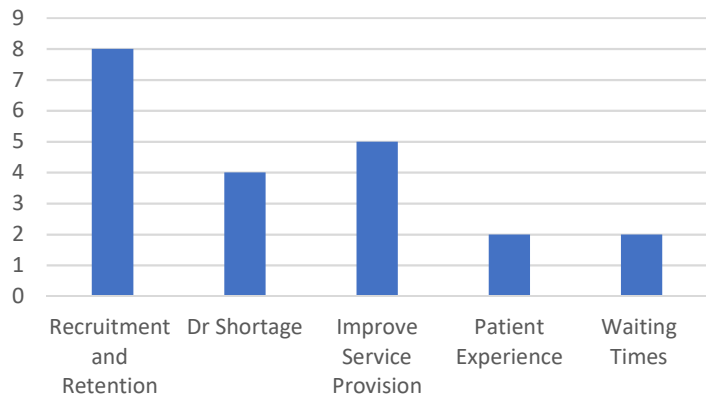


Chart 7:

Have you been involved with leading the development of protocols/guidelines?



Graph 8: Rationale for introducing the A/CPR role into the service



Graph 9: Was there a business plan with costings attached to introduce the post/s?

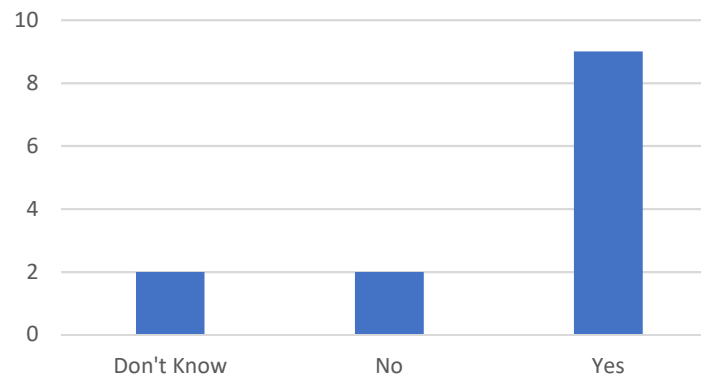
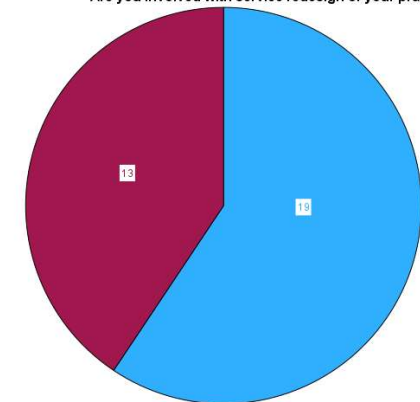


Chart 8:

Are you involved with service redesign of your practice and/or role?



## Outcome measures

Less than half the A/CPRs (17) had key outcome measures for their role; five of which were locally driven, 12 of which were locally and nationally driven.

## Management

The majority of A/CPRs (22) had team leader or line management responsibilities, including all five CPRs. Respondents that detailed which staff members they line managed indicated that this was mainly radiographers and other advanced practitioners or trainees with one respondent specifying that they line manage radiographers and nurses.

## Leadership

One of the responses from a CPR and two responses from APRs stated that they were in a Clinical Director role.

26 A/CPRs have been involved with implementing and monitoring protocols and guidelines for their service and 27 have led these as illustrated by charts 6 and 7. All CPRs have led these developments.

Interview participants highlighted the difference in leadership and management in regards to the leadership pillar. For example, Participant 3 noted their line management responsibilities:

“I have sort of a managerial role within the department as well as my clinical role”, however they identified that leadership went beyond this “it’s actually all about culture isn’t it and actually being a role model” (Participant 3). Leadership was also seen as an activity beyond their individual role, department and even profession. The development as a leader was noted by Participant 1: “I think and while you’re at that Band 6 level, you’re not networking outside of your department, you’re not networking”, they went onto explore their conversations with a wide variety of individuals “reaching outside of my profession” (Participant 1) to impact on their role.

## Research

Nearly all respondents (27) had initiated, led or been involved with research, audits and service evaluations as illustrated by chart 5. Four of five CPRs were in this cohort. 26 respondents gave detail on this which largely fell into the category of audit

work, just one respondent mentioned involvement in clinical trials and only three respondents were involved in more extensive research projects or conducting their own research or service improvement projects with one CPR setting up their own feasibility study. All four of those respondents held Master's degrees (one being under completion) with one respondent holding a PhD. Details of the research undertaken is tabulated below.

Mapping of all the examples of duties performed across the four pillars to the NHSE HEE advanced practice capabilities (NHSE, 2017) revealed that every capability in the framework was covered other than '4.4: Take a critical approach to identify gaps in the evidence base and its application to practice, alerting appropriate individuals and organisations to these and how they might be addressed in a safe and pragmatic way'. Also, only five A/CPRs mentioned work they had published.

<b>Category</b>	<b>Description of research/ audit/ service evaluation</b>
Audit	Imaging- new equipment, immobilisation
Audit/ Clinical Trial	PGD Audit - how much used, record keeping, pitfalls PATHOS clinical trial - video fluoroscopic studies Minimal prep CT colon study - research
Audit	Radiographer led clinics: erectile dysfunction/ vaginal dilators in pelvic radiotherapy patients Time from diagnosis to treatment for malignant spinal cord compression pts.
Audit	New treatment technique audits Patient satisfaction surveys
Audit	Preparation of pelvic patients and assessment of bladder radiotherapy management against national/departmental guidelines and technical delivery
Audit	C-spine immobilisation devices PID for plain film reporting
Audit	IGRT audits Introduction of SABR Lung and Oligometastasis
Audit	Use of primary Xray markers and GP clinical history
Audit	CTC service
Audit	Outcome data submitted to NHSE for SRS
Audit	Limits for specificity and accuracy.
Audit/ Research	Audits and literature reviews to ensure adherence to best practice. Service improvement project to increase efficiency
Audit	Non-compliance with RCR recommendations for single fraction treatments
Audit/ Research	HCC surveillance, quality of different imaging and quality improvement projects for improving patient pathway for GI US PhD research on patient experience of surveillance
Audit	Protocol review and implementation
Audit	Peer review
Audit/ research	Benefit of my role on treatment pathway. Service improvement project (on-treatment and follow up patient reviews)

Audit	Student evaluation
Audit	SABR
Audit	Author the annual BCSP CTC audits
Audit	Imaging, NHSE service evaluation

## Rationale for introducing posts to the service

The rationale for introducing the A/CPR roles into the service are described in graph 8. Themes included; recruitment and retention, medical Doctor shortages, improve service provision, patient experience and waiting times. The most common theme was Recruitment and Retention specified by eight service leads, followed by improving service provision in five cases then medical doctor shortages in four cases.

The following quotes from respondents to the service lead questionnaire indicate the multi-faceted reasons for setting up these posts:

*‘Advanced Practice roles created in 2009 as difficulties in recruiting staff. Funding used to create B7 roles instead of recruitment but with the advantage of making the department more attractive to other staff i.e. as they could see role progression’*

The majority (n=9) of service leads indicated that there was a business plan with costings attached to the introduction of these posts as shown in graph 9.

One comment indicated intra-departmental variation in how these posts are set up:

*‘Some posts as part of a wider service change business case, some through reallocation of medical budget, others via staff and skill mix review and using the pay budget in different ways’*

Others indicated that practice levels can grow beyond the job title given:

*‘The Head and Neck Advanced Practitioner is working at consultant level, hence the need to secure funding for a consultant post which will be additional not instead of ACP’*

## Financial Impact of Advanced and Consultant Practice Radiographer Workforce

Only two service leads confirmed that A/CPR roles within their service were introduced/ developed as part of a cost improvement initiative, both of which specified that the cost saving was from medical doctor substitution from Consultant Radiologists or Consultant Clinical Oncologists.

However, a larger proportion of A/CPRs (18) indicated that there could be cost savings associated with the introduction of their role, including all five CPRs. 17



respondents gave more detail on this, 11 of which referenced medical substitution as a potential cost saving for some of their duties. Three respondents referred to a specific initiative that created their post, all of which were part of a business case for stereotactic radiotherapy. Activities such as radiotherapy planning, on treatment review, prescribing and reporting were also cited as cost savings. Two respondents stated a reduction in costly outsourcing of imaging reporting and four respondents had led cost improvement projects though improving efficiency:

- One respondent refined radiotherapy techniques so that appointment times are reduced and more patients are treated within the same working day profile.
- Two respondents stated a reduction in waiting times, avoiding expensive initiatives and costly waiting time breaches.
- One respondent cited that they have trained others to deliver particular aspects of the service, improving capacity.

## Service Development

19 A/CPRs were involved with service redesign of their practice or role, including all CPRs as shown in chart 8. Examples fell into the following categories: Carving their own role, cost saving initiatives and new services including technical developments, side effect management and increased multidisciplinary team working. In many cases A/CPRs have created business cases and bid for funding. Examples of service developments reported by A/CPRs are given in the table below.

<b>Service re-design examples</b>
Changed and redesigned the practice to involve all fluoroscopic studies, working closely with the Speech and language therapists (SLT) to drastically change that service
I led the development of the consultant role including all governance, monitoring and training with guidance from other centres who have successfully implemented consultant practice
Instigating implementation of rectal spacer as a service - new business case and funding associated with new activity with resources
I am Trust lead for SRS service. I have established a radiographer led new patient clinic, FU clinic for post-SRS and management of radionecrosis
Setting up a SABR service and SGRT for all patients
Development of the paediatric sonographer role in paediatric radiology as the service grows and develops. Supporting shortage of radiologists, improving waiting lists
Informally I have had input in the direction of the team, how we can expand in the future, service improvements etc.

Interviewees identified the impact of their A/CPR role. This was seen in a variety of ways for example reduced waiting times, hospital avoidance, and impact on clinical services for example “less of a burden on care homes and social services” (Participant 2). An impact on service delivery was also noted “When I am involved in the radiotherapy planning, the planning pathway is significantly quicker” (Participant 1).

### Impact on other services

32 responses were given detailing the impact respondents cited on other disciplines or services. Two respondents felt their role had little impact. The remaining responses were related to streamlining and improving the efficiency of patient pathways. Examples are listed in the table below of the perceived impact on other services:

<b>Examples of the impact on other services</b>
Helps to streamline patient pathway, reduce waiting lists, and provide link between other services
Significantly improve the pathway and care of pts requiring palliative radiotherapy. Impacting on reducing the length of stays of in-patients as I am able to treat and discharge them very quickly compared to consultant oncologists. Freeing up valuable clinic time for oncologists leading to improved waiting times for cancer treatments.
Improving report turnaround times facilitating patient pathway
My role impacts endoscopy as they have to devised treatment based on finding highlighted by CTC reports if I get to formally report these.
Quicker decision/treatment time. Particularly for acute/AE patients.
Supporting the surgical team and radiology team in achieving the 2 week waiting target
A large part of my role in the past 3 years has been to improve our efficiency through technical development and improve waiting times for radiotherapy. This impacts the Trust when national waiting time targets are achieved and improves patient experience which is important for the whole of the cancer care division. I have been asked to speak at multiple national and international events and act as a reference site for novel equipment which has boosted the reputation of the Trust.
Encouraged other specialities to look for advanced practitioner roles to support their service. increased the visibility of the profession
Enabled a quicker turnaround for Inpatient services not requiring a radiologist's input. Reduced waiting times for cancer targets and routine outpatient appointments.
Actively involved in trying to reduce wait times for patients by providing data and improving efficiency in the service.

13 service leads also gave examples of the impact that A/CPRs have had on other disciplines or services and are detailed in the table below:

The themes that emerged were:

- Patient focused with prompt discharge, streamlined services, improved continuity of care and improved access to care
- Enhanced MDT working within a service including multi-professional education and communication
- Professional benefits to radiography, especially career progression and also education of radiographers.

<b>What impact do you think advanced or consultant practice roles have had on other disciplines or services?</b>
Allowed prompt discharge within minor injuries. One stop shop for several tumour groups utilising ultrasound and CT.
Improve MDT communication, improved continuity of care for patients, improve access to care, showcase our particular profession
Allows practitioners to work autonomously as they have higher academic and skill levels. Improves career paths
It allows better career framework to staff, improved sense of worth / retention. It can assist with patient care pathways avoiding unnecessary delays/ issues when a consultant was traditionally needed.
Offer better access to Radiology services
Significant beneficial impact to supporting clinical oncologist workload, enabling them to focus on complex and time-consuming tasks. Positive to have career progression and enhanced scope of practise possibilities for the workforce. Encourages and enable multi professional working i.e., SALT, dietetics, CNS
Streamlining of pathways and greater accessibility. Role promotion
Enhanced the profile and understanding of radiotherapy and Therapeutic Radiography across the MDT and primary care

## Chapter 3: Patient Impact of the Advanced and Consultant Practice Radiographer Workforce in the South East Region

### Impact on patient care

A key theme that developed from thematic analysis of the interviews surrounded the clinical pillar and patient care:

#### **'Obviously we are practitioners for a reason' - Patient care as a priority**

Patient care was seen as a priority for individuals. Individuals had a variety of clinical roles, but all worked within a multidisciplinary team with other healthcare professionals "we all add something new to the team" (Participant 3). Their clinical expertise allowed for a development of a new scope of practice. For example, Participant 1 highlighted their role in planning, prescribing treatment and managing side-effects "I do a lot of complex side effect management. Those things that are above the scope of the review radiographers" (Participant 1). They also acknowledged how their clinical roles were still expanding "I will, when qualified, accept my referrals from the MDT" (Participant 1).

All participants identified different roles and responsibilities within their clinical practice but all identified that patient care and the clinical pillar being the most enjoyable and satisfying part of their role: "to have that opportunity in advanced clinical practice and actually have time with patients has been really rewarding" (Participant 3). This satisfaction was seen as directly related to their role as advanced clinical practice as opposed to other practitioner roles: "having that wider awareness is great and you can manage people holistically and you know, it's very rewarding job to do" (Participant 2).

## Patient Caseloads and Practitioner Led Clinics

Chart 9:

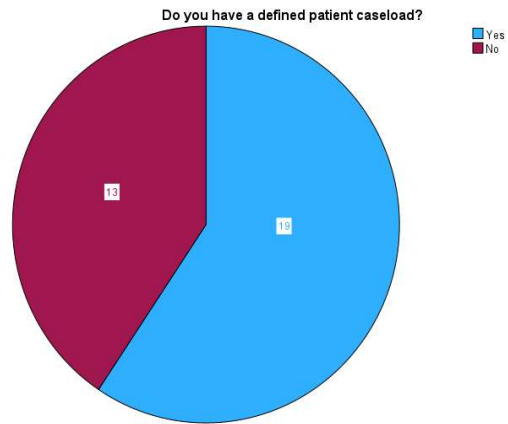


Chart 10:

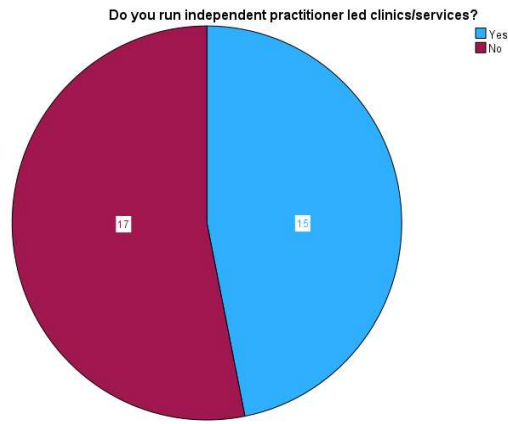


Chart 11:

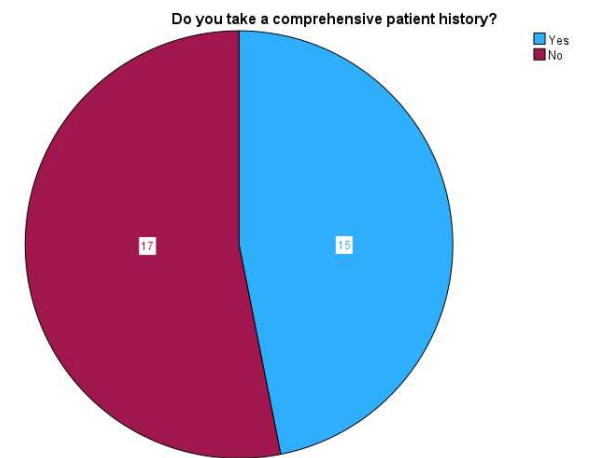


Chart 12:

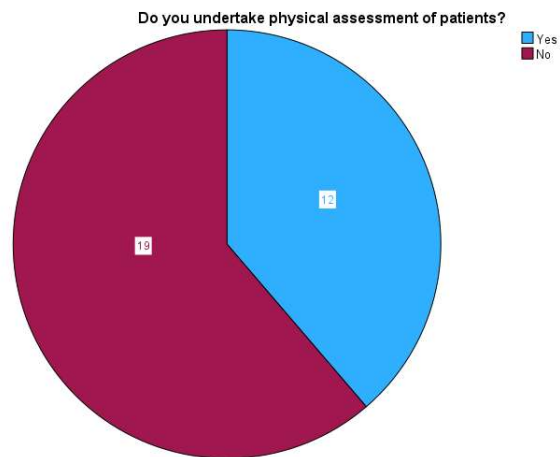


Chart 13:

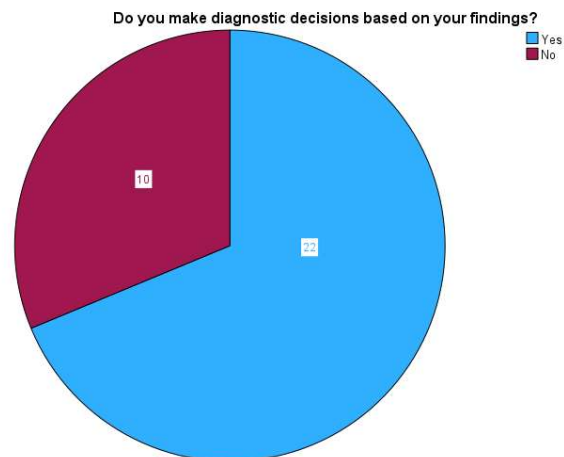
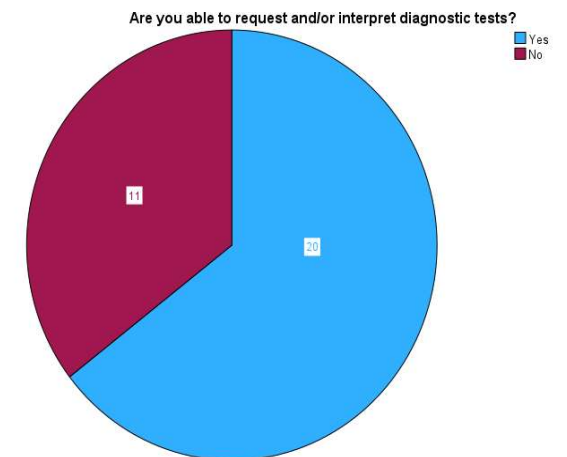
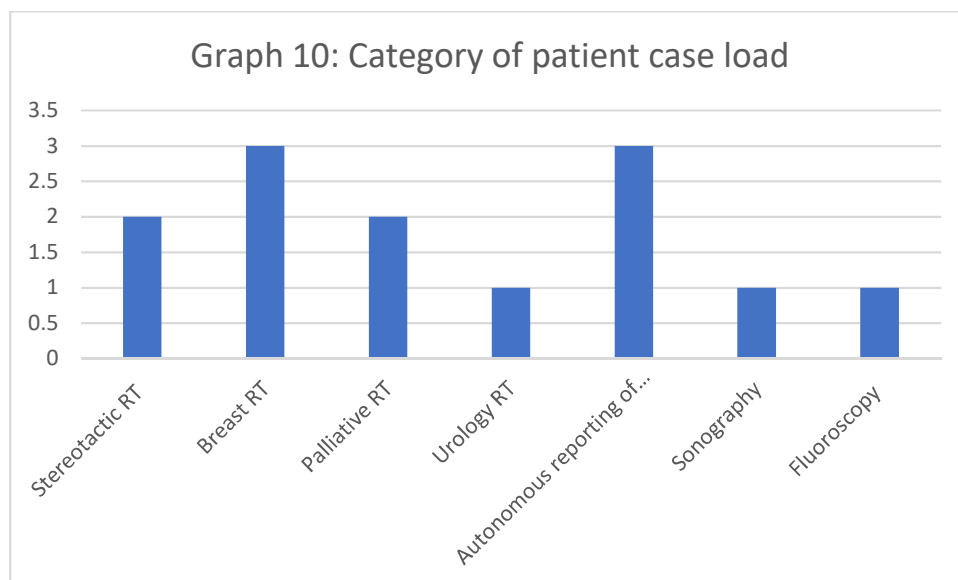


Chart 14:



19 A/CPRs had a defined patient caseload as shown in chart 9; nine with diagnostic radiography as a base profession and ten with therapeutic. Some respondents gave further details on their patient case load, categories are shown in graph 10 below with 'breast RT' and 'reporting of a particular anatomical site' being the most common.



Half (n=7) of service leads reported that A/CPRs within their service ran independent practitioner led clinics/services, four of which were radiotherapy on treatment review clinics for multiple tumour sites with one service lead stating plans to expand this further. In diagnostic departments, most clinics were in the US and IR domain with one service lead indicating an intention to expand this to x-ray.

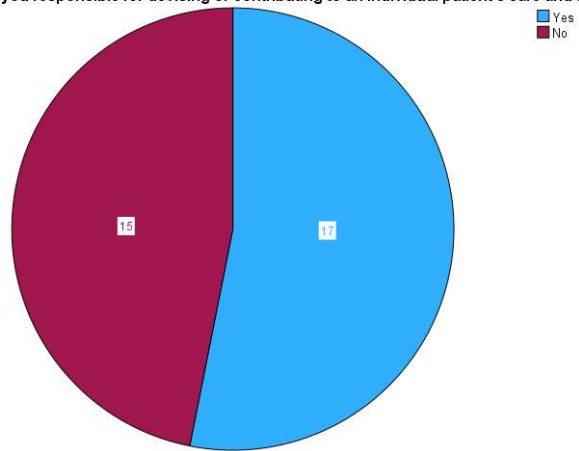
15 A/CPRs (eight with therapeutic radiography as a base profession and six with diagnostic radiography) reported that they ran practitioner led clinics as shown in chart 10, including all CPRs. 12 of these clinics had defined protocols which in all but one case were defined by the advanced or consultant practitioner.

15 A/CPRs undertook comprehensive patient histories, 12 undertook physical assessment of patients, 22 made diagnostic decisions based on their findings as illustrated by charts 11, 12 and 13. All CPRs undertook these duties. 20 respondents requested and interpreted diagnostic tests as shown in chart 14, including four out of five CPRs. Where more detail was given about which tests could be interpreted by the practitioner two categories emerged; radiological imaging and blood tests with 18 and three responses respectively. Imaging was multi-modality, including plain film, CT, MR, Fluoroscopy, PET and mammography.

## Care Planning/ Admission and Discharge/ Screening/ Patient Education

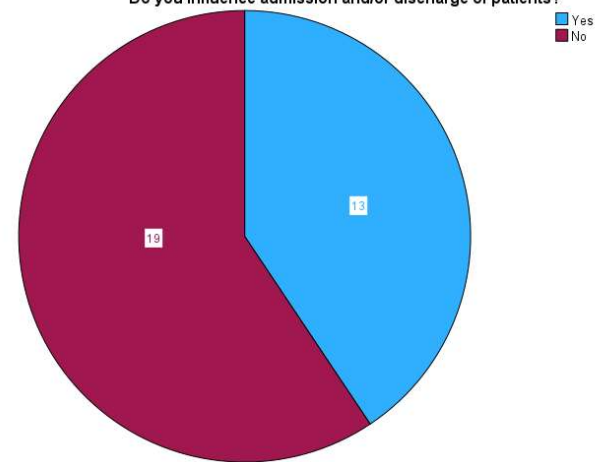
**Chart 15:**

Are you responsible for devising or contributing to an individual patient's care and treatment plan?



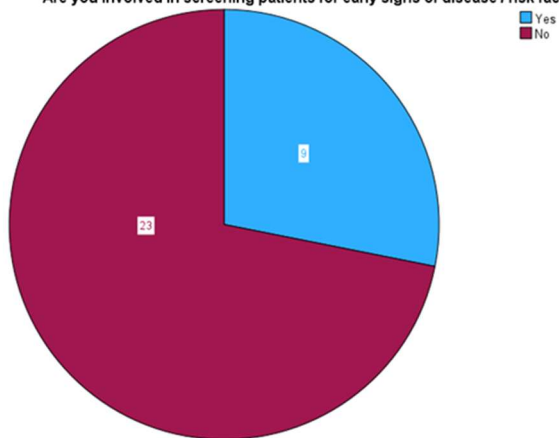
**Chart 16:**

Do you influence admission and/or discharge of patients?



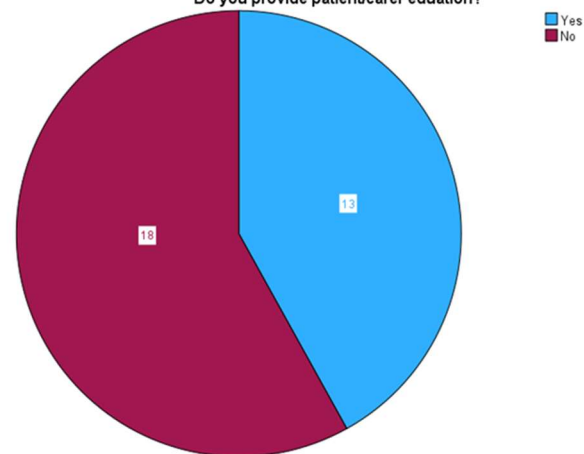
**Chart 17:**

Are you involved in screening patients for early signs of disease / risk factors?

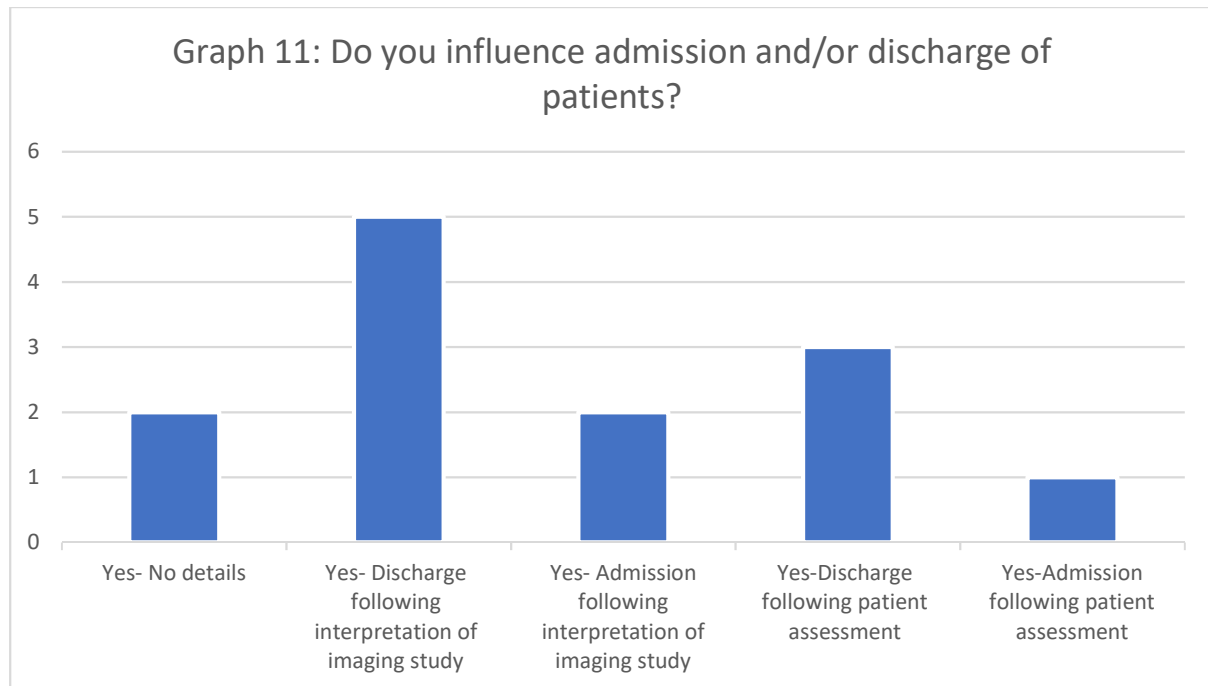


**Chart 18:**

Do you provide patient/carer education?



17 respondents stated that they are responsible for devising or contributing towards an individual patient's care and treatment plan as shown in chart 15. 13 respondents influenced admission and or discharge of patients as shown in chart 16. Where more details were given these could be categorised into; discharge following interpretation of an imaging study, admission following interpretation of imaging study, discharge following patient assessment and admission following patient assessment as displayed in graph 11:



Nine respondents were involved with screening patients for early signs of disease/ risk factors as shown in chart 17. Six of which were diagnostic radiographers, three were therapeutic radiographers and one was a therapeutic radiographer working outside of their base profession. Details of these initiatives are listed below:

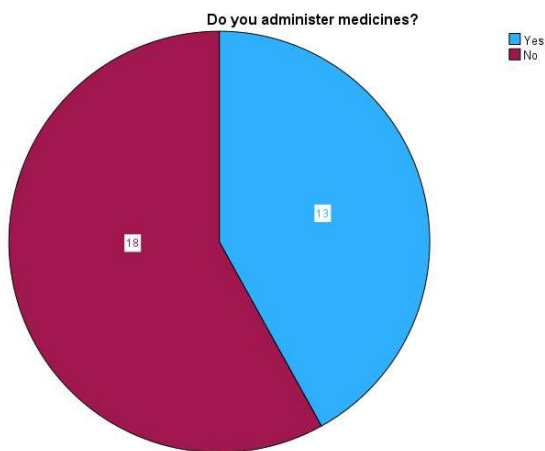
<b>Details of involvement in screening for early signs of disease/ risk factors</b>
Bowel cancer screening programme - CT colonography studies.
Follow up patients from radiotherapy, checking for signs of disease recurrence
Breast cancer recurrence
Staging CTs for patients, if I pick up cancer on their CTC.
Breast screening and assessment patients
Ultrasound imaging and reports with screening for cancer
PKD Nephrocalcinosis, DDH Recurrence, NAFL's, Genetic risk factors

13 respondents provided patient/ carer information as shown in chart 18, including all five CPRs.

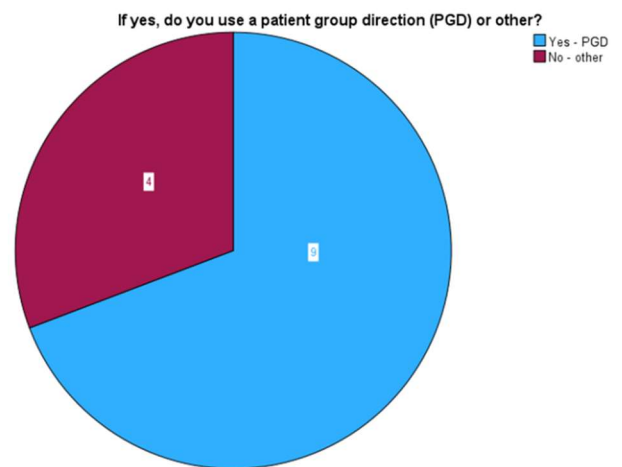


## Administering Medication and Prescribing

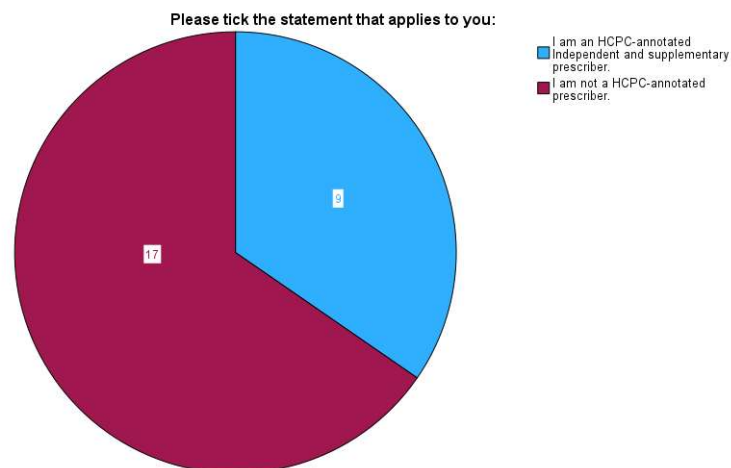
**Chart 19:**



**Chart 20:**



**Chart 21:**



13 respondents administered medicines as shown in chart 19, including four out of five CPRs. Nine of these were completed under a Patient Group Directive as shown in chart 20. Administration was either for RT side effect management and preparation (including laxatives, anti-emetics, analgesics, steroids and anti diarrhoeals) or for imaging guided procedures and imaging studies (including Buscopan, contrast media and local anaesthetics). This was in all but two cases where endocrine therapy and antibiotics were prescribed. All of these listed drug groups could be administered via a PGD in the respondent's centres.

Nine respondents were HCPC-annotated prescribers as shown in chart 21, including all five CRPs. One APR supervises staff undergoing NMP training. An interesting case was raised by a therapy radiographer working outside of RT as an ACP:

*'Despite having NMP competence, there is uncertainty around my ability to prescribe outside of oncology'*

Also of note, one respondent stated:

*'I could use the controlled drugs but have to defer prescribing due to limitations of prescribing practice'*

One respondent also said their role involves de-prescribing.

Commonly prescribed products in the A/CPRs prescribing formulary are:

- Tamoxifen
- Anastrozole
- Letrozole
- Codeine
- Venlafaxine
- Citalopram
- Metoclopramide
- Bisphosphonate
- Tamsulosin
- Solifenacin
- Ibuprofen
- Paracetamol

Interviewees expressed some frustration regarding the role of independent prescribing in advanced practice. The lack of governance and support for radiographers to be independent prescribers was seen as a significant disadvantage for individuals in this role as illustrated by the following quote:

“It would make life a lot easier if I could prescribe” (Participant 3) as this would allow for autonomous working and patient care regarding prescribing. However, this was also felt to impact on their career development “your progression is gonna be hindered. There are fewer roles you can apply for if you can't prescribe” (Participant 2).

## Patient Experience

Most importantly, all interviewees noted the significant impact of their role on patient experience, with all interviewees sharing stories about their impact on individual patients and the lives they had touched.

Examples of patient plaudits obtained via interview are:

*'I consider myself very fortunate to have come under their care.....they are professional, energetically focused, caring and kind'*

*'I simply could not have got through my radiotherapy treatment without your expert advice'*

One plaudit recognised the practitioners practice level:

*'I would like to particularly thank you for your kind and informed advice, which guided me through a very difficult chapter in my life. I shall always be grateful for the fact*

*that at a time when I was at my wits end, you spoke to me in such a clear and compassionate manner, that greatly eased my concerns. I trust your well-deserved progression to consultant comes soon'*

## Chapter 4: Future of the Advanced and Consultant Practice Radiographer Workforce in the South East Region

### Perception about A/CPR roles

#### Positive perceptions

Service leads reported positively on these roles with comments such as:

*'We would be lost without them and need more radiographers in these roles'*

*'They are the back bone of maintaining services'*

#### Impact on the medical workforce

A plaudit provided by a Consultant Clinical Oncologist also conveyed these sentiments about a CPR in their service:

*'There have been many additional benefits to the department which are 'softer' and were not specifically planned..... the go-to source of advice for queries regarding breast radiotherapy patients on treatment (and responding in a timely way), freeing up consultant time and ensuring consistency in decision making....developed expertise and interests beyond those which a Consultant Clinical Oncologist may have, including management of lymphoedema, seromas and arm movement after surgery.....invaluable in helping to train Clinical Oncology Registrars in breast radiotherapy.....become an integral part of the breast cancer MDTs ....Breast Care Nurses and surgeons routinely reach out directly for advice and guidance on radiotherapy-related matters.'*

#### Barriers in understanding

Whilst recognising the pertinence of A/CPR roles concerns were expressed at role set up with many service leads stating that they work well when implemented carefully. There were multiple comments about the backfill of more junior posts when the A/CPR workforce expands such as:

*'Staff moving into these roles is leading to unfilled vacancies in pre-treatment and treatment. Therapeutic radiographers are able to carry out these roles and fill gaps in the Medical and Radiotherapy Physics workforce, in some departments this could be up to 20% of the total number of therapeutic radiographers employed by the Trust but the impact nationally of this has not been taken into account when determining the numbers of training places for radiographers and needs addressing urgently'*

Confusion around advanced practice frameworks and capabilities was also evident with the following comments being made by service leads:

*'When talking about ACP role is very nurse-led and it's still difficult to perceive it as generic and available for other HCP to see the place in the role'*

*'Still a lack of knowledge of what an advanced practitioner is'*

A dichotomy of managerial support for A/CPR roles was identified at interview:

It was highlighted that a level of support was necessary to develop into these roles. This was seen at all levels. For example, Participant 1 noted the support from their line manager “Everything I've learned, she's been there every step of the way and I think she truly understands how much I cross boundaries” (Participant 1). However, they also identified a need to support and share knowledge more broadly: “I don't know that the leadership and the management is robust enough to drag these roles forward” (Participant 1).

Interviewees acknowledged a difficulty and uncertainty around advanced practice within radiography with role variability: “Because you've got a lot of people who call themselves advanced practitioners but aren't really, you know” (Participant 2). Overall, the variation in advanced clinical practice was seen as a positive light: “I don't think any advanced practice is ever gonna look exactly the same.” (Participant 1). There was a sense of unknown about the wider advanced clinical practice workforce in radiography outside of their individual work: “There's just little pockets of advanced practise going on in [radiography], but I.. you know, we're not talking about it very much” (Participant 3). However, they acknowledged that advanced clinical practice was an important step for radiography as a profession: “We want to be able to do... want to be able to facilitate therapy radiographers to move into more diverse roles” (Participant 2).

### Staff working without a reflective job title

Four service leads indicated that they had staff working at an advanced or consultant level of practice without a reflective job title or job description. The current job titles of these roles were:

Working at an advanced practice level:

- Operational Manager - Brachytherapy
- Reporting Radiographer

Working at a consultant level of practice:

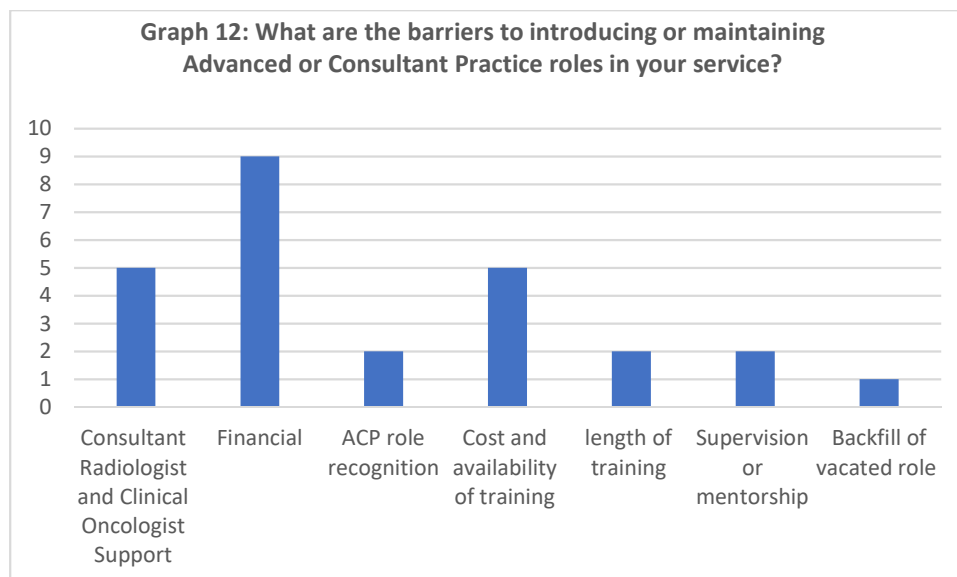
- Lead Advance Practitioner Reporting Radiographer
- Head & neck Advanced Practitioner

One service lead provided commentary on the difficulties around working at a lower level of practice when benchmarked against the multi-professional framework (NHS HEE, 2017):

*‘We have many extended scope practitioners who were called advanced practitioners until recent changes in the framework determined that this was not the case’*

## Barriers to introducing posts

When asked what the barriers were to introducing or maintaining advanced or consultant practice roles in their service, a number of reasons were given and are categorised in the graph 12 below. Financial (n=9), Consultant Radiologist and Clinical Oncologist (n=5), Cost and availability of training (n=5) were the most commonly cited reasons.



## Staff who perform similar roles

The majority of respondents (25) indicated that there are other staff performing similar roles, seven within their organisation, 11 in other organisations and 10 both within and outside of their organisation. All were radiographers and sonographers, only one response indicated other professional groups performing this role: ACPs from nursing, paramedic and physio backgrounds. This respondent now works outside of their base profession.

## Future workforce plans in the SE Region

Nearly all service leads (n=11) indicated that they are planning to introduce new A/CPRs to their service. 3 centres are planning to introduce more than one new post with one centre planning to introduce seven new posts. One centre had no advanced or consultant posts and had no plans to introduce these posts.

19 new posts were specified, details of the job titles of which are specified in the table below. Seven were in diagnostic radiography departments and 12 were in radiotherapy departments. The majority (n=10) of these posts were at a consultant level, seven were at an advanced level and two did not specify the level of practice in the job title.

Job Titles	DR/ TR	APR/ CPR
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Consultant Sonographer	DR	CPR
ACP Palliative Radiotherapy	TR	APR
Consultant Radiographer Mammographer	DR	CPR
Consultant Therapeutic Radiographer- Breast	TR	CPR
ACP Head and Neck	TR	APR
Lead AP Radiographer	DR	APR
Paediatric Sonographer	DR	Unspecified
Reporting Radiographer	DR	Unspecified
Consultant Radiographer	TR	CPR
ACP for SABR	TR	APR
Consultant Nuclear Medicine	DR	CPR
Urology Consultant Radiographer	TR	CPR
Head and Neck Consultant Radiographer	TR	CPR
Lung Consultant Radiographer	TR	CPR
Palliative Consultant Radiographer	TR	CPR
Urology Advanced Practice Radiographer	TR	APR
Breast Advanced Practice Radiographer	TR	APR
Lung Advanced Practice Radiographer	TR	APR
Consultant Mammographer	DR	CPR

## Vision for the future

28 respondents specified what their vision would be for their service in an ideal world, details of which are listed below. Visions broadly reflected a desire for more A/CPR roles, improved capacity and streamlined services with reduced waiting times and implementing state of the art techniques:

<b>A/CPR Visions for Service</b>
Managing a tighter reporting timescale, especially for CTC - double reporting all symptomatic and BCSP patients alike.
Further expansion on my competencies and caseload, additional consultant roles such as mine to expand the service
Funding for radiographers to train as advanced and consultant practice radiographers to enable many more radiographer-led services
Advanced practitioners in roles supporting the radiotherapy service, allowing for career progression and succession planning
Expand and ensure cross cover supported. So many ideas but restrictions are in place, would love to have a consultant post and work with a team or several teams.
Cover all plain film aside ring-fenced images, stream line services to allow CXR straight to CT, urgent MSK findings to other modalities and timely discharge for ED
To have a solid pathway for advanced practitioners in our department. To implement SGRT. Clear our backlog of patients from post pandemic. Have a more efficient service for all areas of the department (treatment, CT, Brachytherapy, Orthovoltage) Expand the advanced practice and consultant radiographer team
Better recognition and universal respect for the responsibility and service provided. Capacity for same day reporting

My vision is for the service to allow CTC Advanced Practitioner to report CTCs and allow for the structure to include a consultant CTC. Radiographer (Band 8B or higher) who can support all other CT radiographers who perform or report CTCs.
To be nationally recognised as a centre of excellence for SRS
Increased staffing in my office to cope with increasing patient workload! Multiple staff specialising in treatment preparation and all staff competent at the basics for on-call purposes
We would have a team of reporting radiographers able to cover all (or majority of) acute sessions that are currently outsourced in our trust to raise reporting radiographer profile and reduce overall cost.
I would like to be a consultant radiotherapist - I have the background and MSc in ACP, supported by clinical experience outside of oncology, reflecting the scope of disease seen in general practice and emergency care.
Training of additional advanced practitioner to share the patient load and reduce the waiting list would be warmly welcomed. Also, having an input in purchasing new equipment helps to ensure happier working force.
For every patient to receive timely radiotherapy, within defined national targets using the most up to date, world class techniques.
Advance my role further and look to succession plan so that there is a team who contribute to the advanced service, developing new areas of speciality and work cross-sectional across modalities.
Similar to current but upscaled to keep within KPI targets without persistent outsourcing.
Recognised ACP led services as a career for Technologists.
Weekend reporting and bank holiday reporting.
Recognition from other health professionals and Trust management that without a radiographer-led service patient waiting times would increase and some services would stop. To be able to increase workforce.
An additional ultrasound room, another ultrasound machine, sonographer consultant lists running at the same time, more complex cases for sonographers, sonographers providing trainee SPR's, supporting trainees by offering paediatric placements, more specialised paediatric sonographer training, elastography lists, networking with other trusts.
Currently do not have a list and perform examination ad hoc. Would like dedicated list.
Majority radiographer lead plain film reporting. Underpinned by strong teaching. Enthusiastic team with progressive management who buy in to change.
My vision for my service would be to achieve excellence in supporting all learners in radiology to achieve the optimal education for their career progression. I would like to demonstrate the value added that education brings and elevate the necessity for continued education and the importance of those who facilitate it.
More clinic time with patients being consented and followed up.
No breaches, improved efficiency using new software/techniques, transitioning to a paperless department.
Increased capacity for treatment, smoother pathway for benign cases. being able to MRI in immobilisation device



An overarching theme from interview analysis was as follows:

***'The future could look really exciting'* – Supporting radiographers into advanced practice**

Participants were positive about their development as advanced clinical practitioners. *"I do believe that if we get the right practitioners into advanced practice roles, we have the ability to transform [...] services in [...]."* (Participant 1). They saw themselves develop into new roles, gaining not only knowledge but a variety of skills and attributes that they would have not developed in their previous role. For example, Participant 2 explained: *"I became very resilient"*, they also went onto identify other ways they developed: *"I think there's a level of autonomy that I didn't get in radiotherapy"* (Participant 2).

Participant 1 identified the need to have support through the provision of knowledge shared across the profession in order to develop these roles in radiography, for example Participant 1 suggested "some sort of forum for sharing knowledge, networking, supporting, etcetera, because I truly believe that the old ways aren't necessarily working well enough."

Overall, participants were positive about their roles and the impact they could have both on their individual career, their services, and the wider radiography profession. "I didn't expect to be so autonomous, so confident in my own abilities. I've never expected that I would have a role that reaches this many individuals and has an opportunity to influence, you know, much more than my little radiotherapy department" (Participant 1).

## Discussion and Recommendations

### Advantages

#### **Service**

A/CPRs have an appreciable impact on healthcare in the SE region. A plethora of roles exist each with unique professional capabilities. This is just a snapshot of the workforce; all A/CPRs reported similar roles in other centres nationally with multiple new A/CPR posts under development. Visions held by A/CPRs showcase the existent and potential improvements to local services such as, improving capacity and implementing state of the art equipment and techniques. 19 A/CPRs reported developing the services that they work within and evidence gathered indicates an impact on waiting time reduction and capacity improvements in both diagnostic and therapeutic settings. A/CPRs act as leaders within their services (three respondents are in a clinical director role), not only having a local impact but also influencing other services with enhanced MDT working.

This is also represented in the international literature. Caulfield (2021) systematically reviewed the international evidence base to assess the perceived or measurable impact of advanced practice. Improved departmental efficiency, shortening referral times and improving access to treatment were the emergent impacts. Similarly, an extensive systematic review by Thom (2018) reported that the majority of advanced practice peer reviewed literature positively affects the NHS workload as well as the individuals themselves who greatly benefit from opportunities to progress to advanced practice roles (Thom, 2018).

Services are facing unprecedented levels of demand and reform. NHS England urges for reform of radiology services both in terms of technical infrastructure and increased advanced practice to carry out expeditious reporting and maximal impact on patient care (NHSE, 2022). Evidence submitted to parliament by Radiotherapy UK stresses that cancer services in England are currently facing record wait times for treatment warranting urgent implementation of new technologies (Radiotherapy UK, 2023). A/CPRs are a key staffing group to manage these challenges and changes. Nearly all A/CPRs in this study implement and lead changes in practice such as new protocols and guidelines and also conduct regular assessment of this indicated by the majority of A/CPRs routinely auditing their services.

Joyce et al. (2022) conducted a training needs analysis of therapeutic radiographers in the advent of MRI guided radiotherapy techniques and the role changes this brings about. This was found to be diverse which the authors concluded will cause difficulty when seeking to train a work force capable of undertaking MRI guided radiotherapy (Joyce et al, 2022). This is an example where A/CPRs are ideally placed to drive forward such developments and lead education and strategies locally and nationally for such paradigm shifts. A/CPRs reported multiple examples of technical and discipline specific training courses as well as Level 7 awards in Radiography specific course.

Studies of a smaller scope evidenced the impact on particular services. Spacey et al. (2021) performed a systematic review of AP in mammography and found that the introduction of the ACP role for breast diagnosis was key to expanding and developing existing services to cope with the increasing demand on the breast pathway. Milner (2018) found through questionnaire responses from radiology staff that there was a faster turnaround time for reports by A/CPRs, improved training of junior colleagues, and an improvement in overall standards.

Skills sets of this group are transferrable into primary care outside of a hospital setting such as Community Diagnostic Centres recommended by the Richards report (NHSE, 2020). Heales et al (2021) set out a vision of how advanced and consultant practice radiographer roles can maximise the potential of Community Diagnostic Hubs. The authors proffer that in the advent of telemedicine, radiographers may have the first face to face interaction on the patient pathway. The authors gave proposals for new advanced practice roles in this setting, with detailed recommendations of how the roles work across the four pillars. Whilst this report is aspirational, it further illustrates how A/CPRs can reform patient care.

Importantly, there is a sense of A/CPR roles being transformational with service leads and A/CPRs advocating and role modelling to promote this level of practice. In eight incidences roles were set up specifically to benefit recruitment and retention within the individual service.

## **Patient**

The holistic patient care given by A/CPRs was reported to give utmost job satisfaction and is the driver for individuals to work towards and within these roles. Patient pathway improvements, complex side effect management and new services such as lymphoedema management have been highlighted by this report. Caulfield et al (2021) also found AP radiographers led innovative patient focused changes and new team structures that both continue current service provision whilst creating new approaches. Patient satisfaction increased with enhanced patient access to information.

There are multiple A/CPRs in the SE region working with site-specialist roles and a defined patient caseload. 19 had defined patient caseloads, 14 ran practitioner-led clinics with a desire to extend this further. 22 A/CPRs made diagnostic decisions based on their findings. This aligns with the Cancer Workforce Plan to support patient care (NHSE, 2019). An innovation of which was illustrated at interview by a CRP who has set up a breast cancer long term side effect clinic. This is an excellent example of innovation by this workforce sector using the technical expertise and holistic care possessed by this profession (Hallam and Holborn, 2020). 17 respondents influenced admission and discharge. Effectiveness of APR led discharge is evidenced in the literature at an obstetric sonography service (Kettlewell and Richards, 2022)

Site specific developments were assessed by Tsang et al. (2018) on the impact of an A/CPR led service for Stereotactic RT. It was found that out of 155 consecutive patients over a two-year period there was a 35% increase in the number of patients

treated and decision to treat to treatment times halved in the latter year compared to the former as the post holder became established. The correlation was found to be statistically significant and the authors also noted that the post holder had streamlined patient pathways using more resourceful and innovative ways.

Bradbury et al (2021) retrospectively audited 12 months of reports for patients undergoing CT Colonography. Results support that of other studies where the integration of the AP radiographer to this procedure resulted in more timely diagnosis and decision to treat, positively impacting the effective two-week wait.

Fisher (2021) audited referral information over a one-year period for patients undergoing palliative radiotherapy. It was found that Consultant Palliative Radiographers enabled rapid access to treatment and a reduction in the decision to treat time. Significantly for the service and the individual patients, the average pathway reduction was 14 days to three days for volume planned patients and 13 to two days for virtual sim patients.

## **Financial**

Whilst data on financial implications is limited, it is evident that A/CPRs capabilities are equivalent to that of other professions. Many of the A/CPR services discussed in this report consist of tasks that would have typically been undertaken as part of a medical doctor's role. This offers an apparent cost saving given the difference in pay scales of each profession. Thom (2018) found evidence from the NHS and internationally that substantial cost effectiveness existed when tasks are performed by APRs. A study by Hardy et al, (2016) found that radiographer reporting reduced service costs and maintained quality.

Cost saving comparisons can be drawn to this report; A/CPRs act as clinical leaders, promoting and implementing service developments, the costs of which are hard to capture. However, capacity improvements and waiting time reduction were widely reported which will reduce associated breaches and multiple respondents also indicated that their role minimised costly outsourcing of image reporting. These factors offer a substantial cost saving to the service.

## **Recommendations**

### **Collate multi-organisational data on the financial impact of A/CPR posts to quantify the value of these roles:**

Financial reasons are reported as the greatest barrier to setting up these posts. National or regional data collection around this is necessary to quantify not just the cost savings associated with these roles but the value they bring to the service. A network wide collation of impact statements on factors such as activity increase, waiting list reduction and service innovation is needed. Existing evidence solely

quantifies hourly earnings by comparative roles. This will aid organisational business case development and approval for any new posts.

**Review of medico-legal limitations to advanced practice to improve radiographer independent prescribing of medications:**

A/CPRs reported regulatory impairments around radiographer-led prescribing as disadvantageous to role effectiveness, autonomy, patient care and career progression. There were only nine HCPC annotated prescribers amongst all respondents. Nine respondents administered medications under a PGD. Frustration around entitlement to prescribe was particularly apparent amongst DR respondents. There is increasing pressure for change; diagnostic radiographers will be pivotal in supporting safe access to medicines in planned Community Diagnostic Centres and increasingly in acute Trusts where radiologists or other medical staff are less available (SoR, 2021).

In the literature an example of further AP role extension for diagnostic radiographers is in osteoporosis and fracture prevention. The narrative review demonstrated a reduced burden on primary care by streamlining the patient pathway. Inability of diagnostic radiographers to be independent prescribers is a limitation of this role (James et al., 2021). There is also evidence of this in RT with one ACP working in frailty outside of their base profession of RT being unable to prescribe.

**Improvement in understanding of advanced and consultant level of practice: An increased awareness of advanced practice frameworks set out by NHSE WT&E and CoR is needed amongst service leads and A/CPRs alongside proactive job planning and specifications to enable four pillar working:**

Respondents described a plethora of unique A/CPR roles. Duties performed across the four pillars were variable. This specificity is beneficial in that the needs of the individual services are met. However, disparity in practice is evident. One third (11) of A/CPRs that provided examples of this were not working across the four pillars. Interviews revealed a perception of this amongst the profession. The expanse of clinical work and impediment upon the remaining three pillars was emphasised repeatedly. Interviewees reported that only around 20% of their time was available for research, leadership or education.

The largest scale international study into advanced practice roles amongst radiographers is that of Oliveira et al. (2022) and (2023) corroborating these findings. The first study consisted of 23 semi-structured interviews from 14 European countries. Aligning with other smaller studies, whilst stakeholders valued the importance of the four pillars of AP there was a perceived lack of dedicated time to cover them.

In addition to time constraints, responses from both service leads and A/CPRs indicated limited awareness and understanding of the capabilities set out in these frameworks. In 2017, Health Education England and NHS England and NHS Improvement worked in partnership to develop a national framework for advanced clinical practice across multiple professions to provide national consistency and understanding about advanced level practice (NHS HEE, 2017). In addition, the CoR

released a comprehensive ECF to define and illustrate practice levels in the Radiography profession (SoR, 2023).

Woznitza et al (2021) conducted a UK wide survey of diagnostic radiographers and correlated the results of 97 responses with the expected advanced and consultant practice standards. 68% of Trusts expected AP radiographers to adhere to HEEs AP capabilities. 7 Trusts required AP radiographers to fulfil solely the expert practice pillar. Distinction between enhanced and advanced practice was found to be lacking. Activities recorded such as reporting fell within the enhanced domain. Harris et al (2021) also directly addressed disparity between roles that are perceived to be AP and the HEE multi professional career framework for AP definition. Only 32.5% of the 42 diagnostic job descriptions that had 'advanced' or 'specialist' in their job title met the framework criteria leading the authors to urge for greater consistency in job descriptions to support AP radiographer role development.

Respondents expressed a desire for improved standardisation. Khine and Stewart-Lord, (2021) addressed this for advanced practice within the RT profession by conducting focus groups and thematic analysis revealed four themes: ownership of professional identity, desire for standardisation and guidance and drivers of role development; indicating a desire amongst this group for more parity. Akin to other studies, time to work across all four pillars, especially research and education, was cited as an issue. Harris and Paterson 2016 also found this to be evident through 25 interviews at a consultant level where an excessive clinical workload is detrimental to the other domains, especially research.

There was evidence of pro-active job planning amongst respondents in this report when posts were funded via business cases for new services such as stereotactic radiotherapy. Work around enhanced-level practice and its comparison to advanced practice may also alleviate disparity (Snaith and Beardmore, 2021) (Cain and Verrier, 2020). Funding routes were variable which may impact the scope of the practitioner in post. There is evidence in the literature of optimal alignment with standards when posts are pro-actively planned. Duffton et al (2021) whilst recognising that consultant posts are set up in response to individual service needs and are inherently diverse making standardisation challenging. Careful job planning at the point of business case development for new posts is necessary to ensure coverage of all advanced practice domains and capabilities.

### **Improvements to employer specified educational requirements and job planning for A/CPRs and increased regional and national provision of training around supervision, leadership and management and patient assessment:**

The mapping activity performed in this study suggested that level 7 study consisting of a full MSc enables practitioners to work across the four pillars. Reported educational backgrounds varied widely with many respondents having little or no Level-7 education; nine A/CPRs had a postgraduate diploma and six had an undergraduate qualification (BSc). Service leads specified some post-graduate study for new post holders but did not require a full MSc. A variety of degree titles were seen amongst A/CPRs who held a full MSc. 12 A/CPRs held or are studying for MSc's pertaining to advanced practice, more commonly amongst RT respondents.

Education was the most common theme that emerged from an extensive systematic review by Caulfield (2021); perceived education requirements varied with agreement that universal pathways should be established leading the author to recommend local and national education strategies which could be overseen by the individual NHS Trusts. Some staff felt isolated with a lack of educational and training support covering the four domains and managerial indifference. Similarly, only nine Trusts in the study by Woznitza et al. (2021) required a full MSc degree for this level of practice which leads to a national disparity in practice.

Oliveira et al. (2023) through extensive review found a clear educational gap expressed by APRs for the research and leadership domains as well as discipline specific elements such as treatment planning, imaging modalities and emergent treatment techniques. The researchers recommended international establishment of governance structure and role regulation to overcome the lack of educational support and inconsistent levels of practice. AP Apprenticeship programmes may overcome the barriers to implementing such roles. (Spacey et al, 2021).

Key areas noted in this study where a lack of training was evident are; supervision, leadership and management and physical assessment.

28 A/CPRs reported that they supervised other staff members but no responses indicated training around supervision. Also, of note is that in all responses their own supervision was by Doctors. Supervision was also cited as a barrier to setting up new posts. A network wide approach to supervision training may enhance supervision skill sets amongst A/CPRs aiding new post implementation within this group of practitioners.

22 respondents indicated that they had leadership and line management responsibilities and only four A/CPRs reported training in this area. 12 A/CPRs reported undertaking patient assessment, four of which held an Advanced Clinical Practice MSc and the remaining respondents did not indicate any formalised training in this area.

### **Implement a network-wide approach to planning future posts to expedite A/CPR provision and alleviate local disparity in scopes of practice, job titles and banding:**

Many of the A/CPR job roles in the region have evidently grown organically over time in response to changing service needs. Roles have existed between 0.5 to 21 years. There is variability in job titles and banding (ranging from Band 7 to Band 8C). Many A/CPRs have reported expansion of their scope of practice overtime with service leads stating difficulties around re-banding as roles have expanded.

19 new posts are reported to be currently under set up in the region. This provides the impetus to take a network-wide approach to A/CPR workforce planning. Khine and Stewart-Lord (2021) found centrally led transformation rather than evolution improved standardisation.

### **Outcome measures for A/CPR roles need to be defined at a national and local level:**

Less than half of respondents (17) had outcome measures for their role, which in most cases were nationally driven. Expansion of defined outcome measures for all A/CPRs needs to be implemented to ascertain practice levels and its service impact. Nightingale et al. (2018) distinguished the consultant role from advanced or specialist practice roles in radiology departments by reporting on five trainee consultant radiographers guided by a locally devised outcomes framework. The benchmarking tool was found to support the transition of the radiographers to consultant practice. Similarly, Snaith et al (2018) found a nursing toolkit is applicable to the radiography profession.

### **Encourage and increase involvement of A/CPRs in extra-departmental research activity and dissemination both nationally and by service managers:**

Whilst the majority of respondents undertook local research projects, namely audit, only four APRs and one CPR reported being involved in higher level research activities such as clinical trials. One of these respondents held a PhD, all of which held MSCs. The only capability (HEE, 2017) left uncovered following mapping of examples provided was 4.4 which relates to conducting practitioner's own research to alleviate gaps in the evidence base. Only five respondents had published findings from research activities.

The literature is also reflective of a lack of research activity. Harris and Patterson (2016) also found variations in the amount of research undertaken by CTRs citing lack of dedicated time out side of the clinical domain and managerial understanding of this part of the role as the main facilitators. Oliveira et al. (2023) sent out an anonymous online survey to APRs. The results from 189 respondents demonstrated a trend to work more on the clinical pillar with little time on the research pillar. Not only is this problematic for role fulfilment, it was felt that this affected evidence-based practice and the quality of care. A/CPRs are a key staffing group capable of collaboratively delivering national trial portfolios which warrants expansion.

### **Increase advanced and consultant practice accreditation applications amongst the A/CPR workforce and impress the value of this upon service leads:**

Very few respondents are accredited as working at an advanced level of practice. Some of the holders of ACP MSc's may have undertaken this at an accredited institution. However, only two respondents have undertaken the HEE ePortfolio (supported) Route (NHS HEE, 2023). Only two service leads specified this as a requirement for new post holders. Nine service leads reported that A/CPRs in their service do not hold accreditation. Two respondents held SoR advanced or consultant practitioner accreditation (SoR, 2022). Time to undertake this was reported as the main barrier and four respondents held a perception that there was nothing to gain.

The literature also supports these findings in that there is not enough perceived value in accreditation (Deane et al., 2019). Whilst advanced practice accreditation is not currently mandated by most employers, a lack of official recognition of capabilities and appropriate educational backgrounds decreases the governance and recognition of experience, knowledge, and skills of existing, experienced advanced practitioners in the workforce which has implications for care quality. This



needs to be reviewed urgently and measures put in place to achieve accreditation to improve governance of these roles, employer accountability and patient safety.

**Collate a robust body of evidence on patient outcome and experience from A/CPR led services and interventions:**

There is very little evidence on patients' own experience of services delivered by A/CPRs. Some plaudits were provided by patients, only one of which recognised the level of practice. A robust evidence base about patient outcomes and experience could enhance business cases put forward for new posts. Also, it could enhance patient involvement in designing and delivering services.

Patient outcome data on A/CPR services is also limited and needs further review. Hardy et al (2016) conducted a systematic review focusing on patient outcomes with AP led radiography. Due to the lack of literature only seven studies were included. As with most comparative literature for this topic, the authors noted that most studies looked at radiologist role substitution comparisons and questioned the efficacy of this given that inter-professional skills and experience differ. The quality of reporting was found to be equivalent to that of a radiologist and concluded that the speed at which radiographer led reports can be generated compared to that of a radiologist enhances clinical decision making, especially in the emergency setting resulting in faster treatments which could lead to improved outcomes.

**Improve inter-professional understanding of A/CPR roles to aid professional colleague support for role adoption:**

Many respondents, both service leads and A/CPRs, cited Consultant Radiologist and Clinical Oncologist support as a barrier in setting up these posts and working effectively with in them. Managerial support was also noted as lacking in some cases with one service lead perceiving advanced practice to fit better with other professions such as nursing.

An example of support for blurring professional boundaries and the impact on scope of practice was explored through interviewing APRs working in breast screening (Thom, 2018). APRs felt appropriately trained and skilled to deliver malignant results, however this was still performed by radiologists. Extending the APR scope of practice could alleviate breast service pressures.

Caulfield (2021) reported that APs experienced high levels of job satisfaction but only when management, mentors and peers gave their support, benefiting recruitment and retention. Ongoing support from the medical profession and other professional roles is essential to avoid interprofessional tension and enhance service delivery.

**Implement robust career pathways for A/CPRs and improve provision of CPR roles aiming to retain the workforce:**

Some centres involved in this project evidenced an established A/CPR workforce. There was evidence of imminent increase in the A/CPR workforce in the region with 19 new posts planned, 10 of which are CPR posts.

However, locational disparity was also evident with one centre that had no A/CPR roles and no plans to implement any. A key finding was that only four centres had CPR roles. Even with new additional posts a lack of CPR posts brings into question the succession of this workforce and career progression for those working within it.

A study by Milner (2018) evidenced improved investment in the APR DR workforce when CPRs are in post. Duffton et al. (2021) reported key challenges of consultant post holders were the level of scrutiny and difficulty justifying their benefit to stakeholders. Caulfield (2021), reinforced the importance of a supportive clinical team and department to ensure succession planning of these roles. Khine, (2018) qualitatively researched the perceptions of the wider MDT on the organisational impact of CPRs using focus groups, case studies and interviews. Impacted service targets and improved patient experience were key emergent themes.

The new posts seemed to be more prevalent in RT compared to DR (12 versus seven respectively) indicating that A/CPR provision within DR services needs to be enhanced. Also, the benefits of CPRs needs to be communicated more widely; in this study all CPRs reported cost savings, all led service developments and all assessed patients and made diagnostic decisions.

There was also evidence that some practitioners work beyond the title given. This could indicate that there are APR's achieving a CPR level of practice and pathways for recognition of this need to be implemented at an organisational level. This is imperative for succession planning.

### **Review of radiographer staffing numbers and increased provision of pre-registration training:**

Heightened concern was expressed by some service leads around creating A/CPR posts and how the roles that successful applicants held previously are backfilled. There is a shortfall in the Radiography workforce of around 8% with the highest turnover at more junior levels (SoR, 2022). This brings about a negative impact on the general day to day running of the department when staff gain promotion to A/CPR posts. This has to be weighed against the multitude of benefits A/CPR posts bring to the service, however, backfill of more junior posts will only come about if pre-registration training capacity for radiographers is increased nationally.

### **Higher Education Institutions (HEIs) to increase involvement of A/CPRs in Level 6 and Level 7 curriculum design and delivery:**

Whilst all respondents indicated that they work within the education pillar, only six specified that they provided education outside of their department or with an HEI. The vast knowledge and experience of this group warrants involvement in HEI educational programmes to improve content quality and enhance role fulfilment of the individual A/CPRs.

## Conclusion

This impact and scoping project has demonstrated a host of benefits brought about by the A/CPR workforce in the SE region, namely:

- i. Enhanced access to care
- ii. Enhanced patient experience
- iii. Improved service delivery and efficiency
- iv. Implementation of service developments
- v. Provision of a rewarding career pathway for radiographers

Whilst providing a snapshot of the talent and skill of the Radiography workforce in the SE region, this report has identified disparity in existing roles, educational backgrounds with a need for full MSc completion, accreditation and interpretations of practice levels. Implementation of the service, organisational, regional and national recommendations generated by this report will allow improved uptake of these roles and robust governance that will safeguard and raise the professional profile of the A/CPR workforce.

## References

- Bradbury, C., Britton, I., Morley-Davies, A., & Balasubramaniam, R. (2021). *What is the impact of CT colonography interpretation by advanced practitioner radiographers on delivery of the 28 day colorectal cancer target?* Radiography (London, England : 1995), 27(4), 1130-1134. doi:doi:10.1016/j.radi.2021.06.005
- Cain, G., & Verrier, W. (2020). *Radiographer Advanced Practice in Clinical Reporting Quality assurance by continuous audit: a five year review.* Imaging & Therapy Practice, 21-21.
- Caulfield, L. (2021). *A literature review exploring the perceived impact, challenges and barriers of advanced and consultant practice in therapeutic radiography.* Radiography (London, England : 1995), 27(3), 950-955. doi:doi:10.1016/j.radi.2021.01.002
- Deane, L., Robinson, L., & England, A. (2019). *An investigation into the perceived value of the College of Radiographers voluntary accreditation scheme for advanced and consultant practitioners in breast imaging.* Radiography, 25(3), 207-213. doi:doi:10.1016/j.radi.2019.01.004
- Duffton, A., Moore, K., & Williamson, A. (2021). *Diversity in radiation therapist/therapeutic radiographer (RTT) advanced practice (AP) roles delivering on the four domains.* Technical innovations & patient support in radiation oncology, 17, 102-107. doi:doi:10.1016/j.tipsro.2021.02.003
- Fisher, S. (2021). *The role of the Consultant Radiographer in facilitating rapid access to palliative radiotherapy.* Radiography (London, England : 1995), 27(4), 994-999. doi:doi:10.1016/j.radi.2021.03.005
- Hallam, E., & Holborn, C. (2020). *A critical evaluation of the impact of the consultant practitioner role in the management of late effects...*The College of Radiographers Annual Radiotherapy Conference, January 24-25, 2020, Hilton Brighton Metropole, Brighton, England. Radiography, 26, S14-S15. doi:doi:10.1016/j.radi.2019.11.036
- Hardy, M., Johnson, L., Sharples, R., Boynes, S., & Irving, D. (2016). *Does radiography advanced practice improve patient outcomes and health service quality? A systematic review.* The British journal of radiology, 89(1062), 20151066. doi:doi:10.1259/bjr.20151066
- Harris, M., Snaith, B., Adamson, H., Foster, B., & Woznitza, N. (2021). *An analysis of advanced and specialist posts in diagnostic radiography: Do job descriptions describe advanced practice?* Radiography (London, England : 1995), 27(2), 437-442. doi:doi:10.1016/j.radi.2020.10.008
- Harris, R., & Paterson, A. (2016). *Exploring the research domain of consultant practice: Experiences of consultant radiographers.* Radiography, 22(1), e25-e33. doi:doi:10.1016/j.radi.2015.07.003

- Heales, C., Mills, K., & Ladd, E. (2021). *Radiographer advanced and consultant practice and community diagnostic hubs - a vision for the future*. *Radiography* (London, England : 1995), 27, S28-S33. doi:doi:10.1016/j.radi.2021.05.004
- Institute for Apprenticeships and Technical Education.(2018). *Advanced Clinical Practitioner (Integrated Degree)* Retrieved from:  
<https://www.instituteforapprenticeships.org/apprenticeship-standards/advanced-clinical-practitioner-integrated-degree-v1-0>
- James, R., Griffin, J., Senior, C., & Love, R. (2021). *The role of the Radiographer in osteoporosis and fracture prevention services - a narrative review*. *Radiography* (London, England : 1995), 27, S34-S38. doi:doi:10.1016/j.radi.2021.07.020
- Joyce, E., Jackson, M., Skok, J., Peet, B., & McNair, H. (2022). *Images and images: Current roles of therapeutic radiographers*. *Radiography* (London, England : 1995), 28(4), 1093-1100. doi:doi:10.1016/j.radi.2022.07.016
- Kettlewell, L., & Richards, S. (2022). *A mixed method study into obstetric sonographer-led-discharge and other forms of sonographer role extension*. *Ultrasound* (Leeds, England), 30(3), 209-217. doi:doi:10.1177/1742271X211038296
- Khine, R. (2018). *The Perceived Professional and Organisational Impact of the Consultant Therapeutic Radiographer (CTR): a UK Case Study*. *Journal of Medical Imaging & Radiation Sciences*, 49, S7-S7. doi:doi:10.1016/j.jmir.2018.06.024
- Khine, R., & Stewart-Lord, A. (2021). *An examination of Advanced Clinical Practice: Qualitative insights from therapeutic radiography advanced and consultant practitioners based in England*. *Technical innovations & patient support in radiation oncology*, 17, 97-101. doi:doi:10.1016/j.tipsro.2020.12.003
- Milner, R. (2018). *Perceptions of Radiology Staff on Appointing an NHS Trusts First Consultant Radiographer*. *Journal of Medical Imaging & Radiation Sciences*, 49, S8-S8. doi:doi:10.1016/j.jmir.2018.06.028
- Milner, R. C. (2018). *Consultant Radiographer Advisory Group meeting report*. *Synergy News*, 15-15.
- NHS. (2004). *Agenda for Change*. Retrieved from:  
<https://www.healthcareers.nhs.uk/working-health/working-nhs/nhs-pay-and-benefits/agenda-change-pay-rates>
- NHS Health Education England. (2017). *Multi-professional framework for advanced clinical practice in England*. 24. Retrieved from:  
<https://healtheducationengland.sharepoint.com>
- NHS Health Education England. (2023). *E-portfolio (Supported) Route*. Retrieved from: <https://advanced-practice.hee.nhs.uk/our-work/eportfolio-route/>
- NHS Health Education England. (2023). *Digital Badges*. Retrieved from:  
<https://advanced-practice.hee.nhs.uk/our-work/digital-badges/>

- NHS E. (2019). *Cancer Alliances- Improving Care Locally*, Retrieved from: <https://www.england.nhs.uk/cancer/cancer-alliances-improving-care-locally/>
- NHS E. (2020) *NHS People Plan 2020/21*. Retrieved from: <https://www.england.nhs.uk/wp-content/uploads/2020/07/We-Are-The-NHS-Action-For-All-Of-Us-FINAL-March-21.pdf>
- NHS E. (2020) *Diagnostics: Recovery and Renewal – Report of the Independent Review of Diagnostic Services for NHS England*. Retrieved from: <https://www.england.nhs.uk>
- NHS E. (2021) *Cancer Workforce Plan 2017: Cancer Workforce Plan phase 1 - Delivering the cancer strategy to 2021*. Retrieved from: [hee.nhs.uk](http://hee.nhs.uk)
- NHS E. (2022). *Getting it Right First Time Programme National Specialty Report*. Retrieved from: <https://gettingitrightfirsttime.co.uk/wp-content/uploads/2020/11/GIRFT-radiology-report.pdf>
- Nightingale, J., Hardy, M., & Snaith, B. (2018). *Embedding consultant radiographer roles within radiology departments: A framework for success*. *Radiography* (London, England : 1995), 24(4), 289-297. doi:doi:10.1016/j.radi.2018.06.007
- Oliveira, C., Barbosa, B., Couto, J., Bravo, I., Hughes, C., McFadden, S., . . . McNair, H. (2022). *Advanced Practice amongst Therapeutic Radiographers/ Radiation Therapists. Exploring the potential of the four pillars: preliminary results from a European perspective*. *Journal of Medical Imaging & Radiation Sciences*, 53, S26-S27. doi:doi:10.1016/j.jmir.2022.10.088
- Oliveira, C., Barbosa, B., Couto, J., Bravo, I., Hughes, C., McFadden, S., . . . McNair, H. (2023). *Advanced practice roles amongst therapeutic radiographers/radiation therapists: A European survey*. *Radiography* (London, England : 1995), 29(2), 261-273. doi:doi:10.1016/j.radi.2022.12.003
- Radiotherapy UK. (2023). *Written evidence submitted by Radiotherapy UK and #CatchUpWithCancer campaign*. Retrieved from: [https://radiotherapy.org.uk/wp-content/uploads/2023/06/Written-evidence-april-2023\\_Future-cancer.pdf](https://radiotherapy.org.uk/wp-content/uploads/2023/06/Written-evidence-april-2023_Future-cancer.pdf)
- Snaith, B., & Beardmore, C. (2021). *Enhanced practice: A strategy to resolve the inconsistencies in advanced practice implementation*. *Radiography*, 27, S3-S4. doi:doi:10.1016/j.radi.2021.08.003
- Snaith, B., Milner, R. C., & Harris, M. A. (2016). *Beyond image interpretation: Capturing the impact of radiographer advanced practice through activity diaries*. *Radiography*, 22(4), e233-e238. doi:doi:10.1016/j.radi.2016.07.005
- Snaith, B., Williams, S., Taylor, K., Tsang, Y., Kelly, J., & Woznitza, N. (2018). *Is a nurse consultant impact toolkit relevant and transferrable to the radiography profession? An evaluation project*. *Radiography* (London, England : 1995), 24(3), 257-261. doi:doi:10.1016/j.radi.2018.05.001

Society of Radiographers. (2021). *Independent Prescribing for Diagnostic Radiographers Moves Closer* Retrieved from: <https://www.sor.org/news/advanced-practitioners/independent-prescribing-for-diagnostic-radiographers>

Society of Radiographers. (2022) *Advanced Practitioner Accreditation*. Retrieved from: <https://www.collegeofradiographers.ac.uk/education/accreditation/advanced-practitioner-accreditation>

Society of Radiographers. (2022) *Written evidence submitted by The Society of Radiographers (ECS0030)*. Retrieved from: <https://committees.parliament.uk/writtenevidence/43583/pdf/>

Society of Radiographers. (2023) *Education and Career Framework for the Radiography Workforce*. Retrieved from: <https://www.sor.org/learning-advice/professional-body-guidance-and-publications/documents-and-publications/policy-guidance-document-library/education-and-career-framework-fourth>

Spacey, A., Hipperson, V., Gloster, A., & Mercer, C. (2021). *The role of the advanced clinical practitioner in breast diagnosis: A systematic review of the literature*. Radiography (London, England : 1995), 27(2), 654-662. doi:doi:10.1016/j.radi.2020.08.005

Thom, S. (2018). *Does advanced practice in radiography benefit the healthcare system? A literature review*. Radiography (London, England : 1995), 24(1), 84-89. doi:doi:10.1016/j.radi.2017.08.002

Tsang, Y., Ostler, P., Shah, N., Kudhail, J., & Hoskin, P. (2018). *The Impact of a Consultant Radiographer on Stereotactic Radiotherapy Service*. Journal of Medical Imaging & Radiation Sciences, 49, S1-S1. doi:doi:10.1016/j.jmir.2018.06.007

Woznitza, N., Pittock, L., Elliott, J., & Snaith, B. (2021). *Diagnostic radiographer advanced clinical practice in the United Kingdom - A national cross-sectional survey*. BJR open, 3(1), 20210003. doi:doi:10.1259/bjro.20210003

## Appendix

### Appendix 1: Search Terms for Literature Review

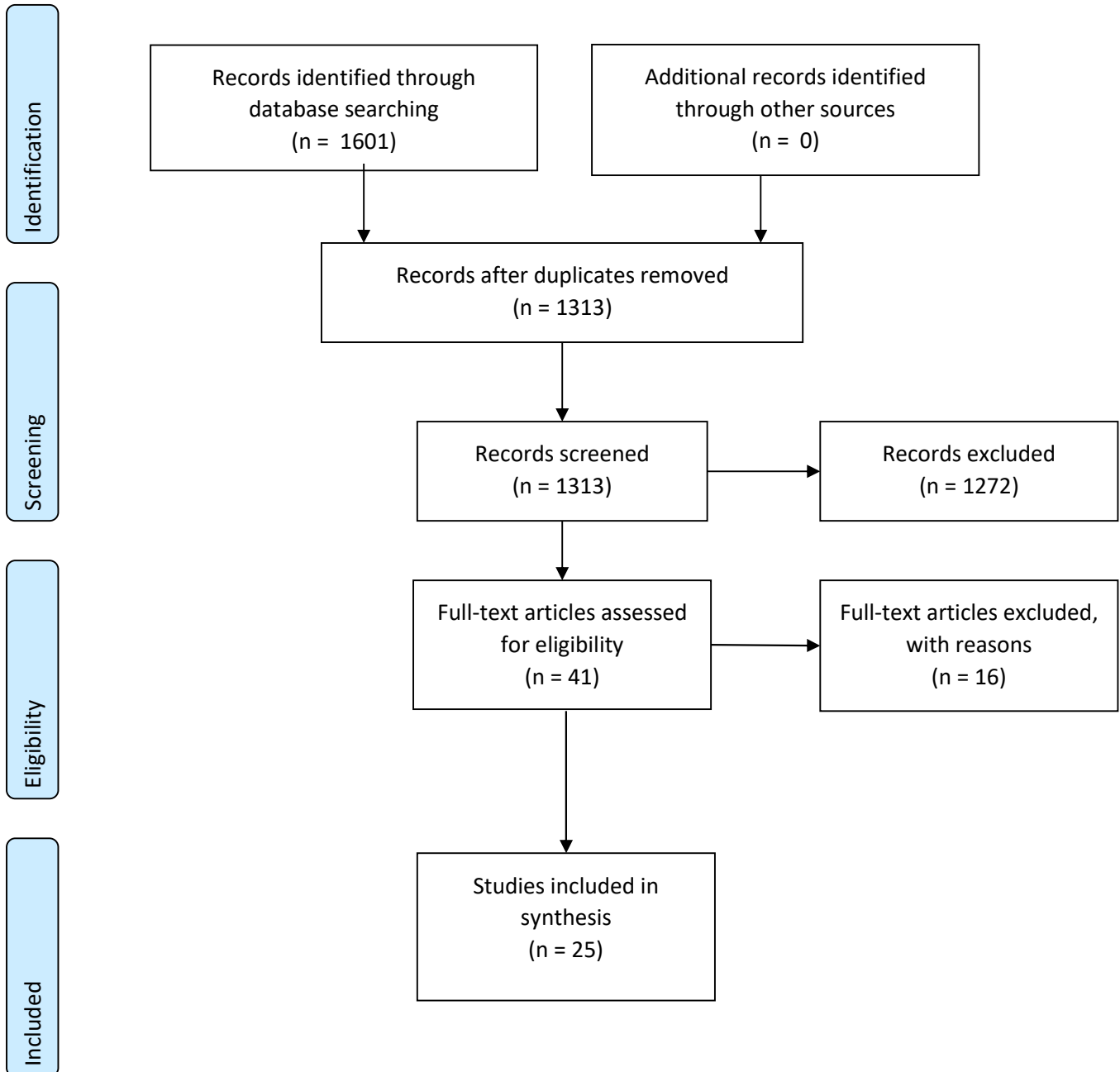
Database	Search Terms	Number of Records
Pubmed	"advanced practice" [T/A] OR "advanced clinical practice" [T/A] OR "advancing practice"[T/A] OR "enhanced practice" [T/A] OR consultant [T/A] OR "enhancing practice" [T/A] AND "radiologic" [T/A] OR "radiographer" [T/A] OR "radiography" [T/A] OR "diagnostic imaging" [T/A] OR "sonographer" [T/A] OR "Radiography"[Mesh] OR "Diagnostic Imaging"[Mesh]	1313
CINAHL	"advanced practice" [T/A] OR "advanced clinical practice" [T/A] OR "advancing practice" [T/A] OR "enhanced practice" [T/A] OR "consultant" [T/A] OR "enhancing practice" [T/A] AND "radiologic" [T/A] OR "radiographer" [T/A] OR "radiography" [T/A] OR "diagnostic imaging" [T/A] OR "sonographer" [T/A]	288



## Appendix 2: Prisma Diagram for Literature Review



### PRISMA 2009 Flow Diagram



### Appendix 3: Summary of findings table for primary/ prospective studies

Article	Year	Method	Sample size	Findings
Woznitza et al.	2021	Survey sent to service leads investigating UK APRs	97 responses out of 174 invites	SoR accreditation rates low Types of roles and Banding variable
Khine and Stewart-Lord	2021	Focus groups of therapeutic APRs in England	36 participants	Job title important Lack of standardisation of practice
Duffton et al.	2021	APR questionnaires structured around 4 pillars	3 APRs with over 10 years' experience	APRs working across all 4 pillars 1 participant with SoR accreditation
Harris et al.	2021	Analysed job descriptions over 6-month period mapped to CoR ECF	42 job descriptions from across the UK	Many roles differ from AP framework
Oliveira et al.	2023	Anonymous online survey sent to APRs	189 participants from across Europe	25% reported a minimum of five years of RT practice to perform AP roles/tasks  Trend of working more within the clinical practice domain with a low percentage of working time allocated to research  Inconsistency in job titles, scopes of practice, and educational backgrounds across and within countries  Education needs regarding knowledge about image-guided and adaptive RT, multimodal imaging and technologies, and advanced treatment planning  Training needs on leadership and management skills and clinical site-specific expertise

#### Appendix 4: Themes and questions for AP radiographer interviews

Theme	Questions
Introductory	<p>What is your job title and band  Please give a description of your role  Please describe a normal working day or 'activity diary'  How long have you been in this role</p>
Role	<p>What is your favourite aspect of your role and why  What is your least favourite aspect of your role and why  Do you have a defined scope of practice  Do you feel you cover any of the 4 pillars more than the others  Which pillars would you like to dedicate more time to  What are the barriers for you to cover all 4 pillars  Do you have a team of people within your service and do you have any management responsibilities  Do you know of any other professionals that do a similar role or aspects of it  What are your career aspirations</p>
Education	<p>What education or qualifications did/ do you require for your role  Did you have work place supervision in place while you were training  If yes, by whom  Are you involved in the education of others  Have you undertaken any formal education training  Have you undertaken leadership courses or training</p>
Service	<p>What is your vision for your service  What achievement/s are you most proud of  Has your work contributed towards service re-design  Did you undertake research activities to achieve this  Has your service evaluated local population needs</p>
Financial	<p>Are you aware of any cost improvements associated with your role  Could any other professionals undertake the role you are doing</p>
Patient Experience	<p>How do you feel you have impacted patient care within your service  Has your service conducted patient experience evaluations, can you share an overview of the outcomes  Has your role impacted waiting times or other national targets  Do you have any plaudits from patients you could share with us</p>