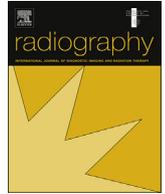




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Advanced and extended scope practice of diagnostic radiographers in Scotland: Exploring strategic imaging service imperatives

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ABSTRACT

Introduction: The development of diagnostic imaging services manifests features specific to the Scottish environment, in particular development of the radiographic workforce through implementing skills mix and role developments to enhance outcomes for patients. A component of a College of Radiographers Industry Partnership Scheme (CoRIPS) supported study, this research investigates perspectives of strategic service managers with Health Board responsibility for service delivery.

Method: A questionnaire survey was administered to strategic service managers across Scotland ($N = 14$), followed up with telephone interviews. There was a return rate of 57% ($n = 8$) for the questionnaires and $n = 4$ agreed to be interviewed. Data collected related to radiographer roles across their Board area; awareness and understanding of service development issues and features as well as perspective on opportunities and barriers in the context of Scottish Government policy, workforce logistics, attitudes and inter-professional relationships.

Results: The results indicate evidence of financial, logistical and political barriers to service evolution, offset by a sense of optimism that scope for beneficial change may be approaching. There are a range of significant initiatives in place and an appetite exists to pursue the development of radiographer roles and skill mix for the benefit of service users more generally.

Conclusion: The difficulties in achieving change are well understood and there are basic issues related to finance and industrial relations. There are also however, cultural elements to contend with in the form of attitudes demonstrated by some radiographers and significantly, the radiological community whose influence on the practice of independently regulated radiographers seems incongruent.

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Introduction

Across the United Kingdom (UK), demographic change, evolving technology and fiscal challenges have created substantial pressures on the delivery of diagnostic imaging services. Government health policy measures have sought to address those pressures.^{1,2} Although Scotland has a fully devolved health and social care system, those pressures exist in essentially the same way as the rest of the UK and the policy elements manifest similar features.^{3–5} These include ‘modernisation’ or redesign of services, integration of health and social care, implementation of skill mix and developed roles for non-medical practitioners, and the notion of patient-centredness in respect of strategic service delivery and visioning.

In 2012 the Scottish Government published its Allied Health Professions Delivery Plan (AHPDP)⁶ outlining the role of AHPs in transforming the Health service into a more patient centred and effective service. The plan made a clear statement of the need to have a ‘significant’ (though unspecified) proportion of plain film images reported by radiographers.

The implementation of policy is an influential means by which change occurs and there is evidence that in a UK context the Scottish experience of service evolution and change is subject to a notable lag factor.^{7,8} In the context of diagnostic radiography, this is manifested by poorer implementation of skill mix, role developments and advanced practice, confirmed in earlier research.^{7,9} The reasons for this are multi-factorial however notably, the devolved arrangements in Scotland are characterised by a structurally and culturally different system of management and leadership.¹⁰ Arguably this remains less ‘commercialised’ and

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more traditional in operation compared to the recent English experience. It may also be the case that a smaller professional community and substantial remote and rural constituency have some impact.

The operational 'reality' of developing extended scope and advanced practice roles for radiographers in Scotland has been explored in earlier research and some reasons for the existing service landscape identified.^{9,11,12} It is important in this context to examine the strategic and visionary aspects of service evolution in order to seek clarity in negotiating the path forward. Awareness of the perspectives of those involved in strategic management of imaging services is crucial in order to identify the facilitators and barriers to developing the service model for patient benefit.

Aims

- Examine the strategic factors that influence the implementation of service change.
- Identify drivers and inhibitors of change.
- Establish a perspective on how change can be achieved, looking ahead.

Method

The participants in this research were those with Health Board (Regional) level responsibility for imaging services and involvement in operational planning and development at a strategic level. They are referred to here under the generic term 'strategic manager'. Job specific questionnaires were sent to strategic managers in each of the fourteen Health Board areas across Scotland. There were two phases: a quantitative questionnaire survey and qualitative semi-structured telephone interviews.

Phase 1: Following a pilot with a group of regional imaging service managers in England, postal questionnaires were administered to the subjects. Closed and semi-structured questions were utilised providing quantitative data supported by contextual comment. Questionnaires included a coded unique identifier.

Phase 2: Phase 1 participants were invited to undertake a semi-structured telephone interview to explore questionnaire responses. Five agreed to take part although one subsequently withdrew. An interview schedule was developed based on key issues arising from the questionnaire responses^{13,14}: implementation of advanced practice; conceptualising skill mix; national health strategy; staff training; terms and conditions; looking to the future.

Ethical implications

NHS REC approval was not required for research involving NHS staff, however as a multi-centred study, R&D approval was required from each site, obtained through the Scottish Network of Clinical Effectiveness Managers. Additionally, the study was approved by the Robert Gordon University Research and Enterprise Services, Ethics Subcommittee.

Data analysis

Phase 1: Quantitative analysis was primarily descriptive and presented in tabular form. Inferential analysis was inappropriate for such a low sample size.

Phase 2: The recorded interviews were transcribed and anonymised. Data analysis utilised the fivefold process recommended by Pope et al.¹⁵: 1) familiarisation; 2) identifying a thematic framework; 3) indexing; 4) charting and mapping; and 5) interpretation

Results

Questionnaires

From fourteen administered, eight questionnaires were returned giving a 57% response rate, following three email reminders and extension of the return deadline by two weeks which provided an additional two responses. Throughout the results section, participants' comments are shown in parenthesis.

4 tier working

Three participants employed the 4-tier career structure as defined by the Society and College of Radiographers. The majority ($n = 5$) stated they employed some elements of it (Table 1). One respondent indicated the change had arisen from a costed strategic plan while others described evolution of service, or a bit of both.

Four participants indicated no post-implementation audit had been carried out. Of the four who did carry out audit, two described audit after introduction of assistant practitioners, one as part of a larger benchmarking exercise and one relating to ultrasound service waiting times in outlying areas. None described any formal research.

With regard to the introduction of advanced practice, only two participants described negative aspects '*limited access to workload make it problematic to maintain competencies*' and, '*due to reporting pressures it has been agreed that radiologists are a more flexible workforce and have therefore been funded in preference to an advanced practitioner*'.

Staff were willing to engage with the implementation of the 4 tier system, although initial concerns were raised by radiographers around introduction of assistant practitioners and '*reluctance by consultant radiologists to support implementation of consultant radiographers as they feel 'consultant' is a misleading term*'. Participants described two industrial relations issues arising from the introduction; both centred around re-banding of radiographers for advanced practice roles.

Five participants described barriers to implementing 4 tier working. The majority outlined financial issues relating to re-banding and funding of new posts. There was also some staff reluctance to take on new roles and implement change. The current pay protection arrangement was seen as significant since some staff with pay protection were unwilling to undertake a change that might be financially punitive. In Scotland, pay protection consequent to the implementation of the Agenda for Change terms and conditions system is not time limited. It is the case therefore that for some practitioners who may have had a high pre Agenda for Change grade, e.g. 'Senior 1' and were job evaluated at a lower banding, there may be a disincentive to seek a higher level post, losing the protection and incurring a drop in salary. These barriers were identified in both rural and urban sites. Participants suggested strategies to overcome these barriers including: i) Ongoing review of demand and capacity with Board level support to increase capacity when required; ii) Change to pay protection arrangements; iii) Fixed sessions for radiologist mentoring of reporting radiographers; iv) Possible collaborative approach to consultant radiologist access and clinical leadership.

Timescale from initial funding to fully implemented service varied from two to five years. The period was shorter if there were radiologist vacancies and impossible to implement if there was a full complement of radiologists. One participant described employing a qualified reporting radiographer, but having no opportunity to use their skills, since no consultant radiologist was in post to provide mentorship.

Team working

$n = 6$ participants were familiar with the College of Radiographers and Royal College of Radiologists joint document 'Team

Table 1
Reported implementation of 4 tier-career structure ($n = 8$).

Tiers in place	Health boards	Areas of practice
4	3	Assistant practitioner, Practitioner, Advanced practitioner, Consultant
3	3	Assistant practitioner, Practitioner, Advanced practitioner
2	2	Practitioner, Advanced practitioner

Working in Clinical Imaging' and four stated their workforce recognised the document's principles. Another respondent stated they 'doubted many were aware except consultants and radiographers and the AHP Director' while others described the 'importance of clinical leadership in implementation of the document'.

$n = 6$ participants described their experience as 'a team based approach' to imaging service delivery. Identified benefits and drawbacks of working in such a manner are as described in Table 2.

$n = 3$ participants ran both rural and urban departments working on a team based approach. This works by: i) Radiologists rotating to rural departments regularly and consultant radiographers giving tutorials to imaging and GP staff in rural departments; ii) Sonographers covering most ultrasound sessions with reporting done centrally; iii) Staff covering all out of hours service when no consultant radiologist is on site.

Diagnostic image reporting

All participants were aware of the publication of the Scottish Government's Allied Health Professions Delivery Plan (AHPDP) 2012⁶ and could name the person identified in their Health Board to take this forward. Only one respondent identified funding available to support implementation. The remainder described various funding agencies which could be accessed.

$n = 3$ participants from an urban site and one from a rural site contracted reporting to an external third party. It was acknowledged that this reporting could be done by qualified and competent reporting radiographers.

The future

Asked what are the current challenges to delivering high quality cost-effective imaging services, the main challenges were:

increasing demand for CT, MRI and US; funding for upgrading equipment; staff retention; patient demographics and changing attitude to evening and weekend working. The service may also be affected by external issues such as lack of radiologists, national targets, lack of sonographers and reduced Government funding.

Additional opportunities identified were: increased plain film reporting and the prospect of a central hub for radiographer reporting, especially out of hours; increasing CT and MRI reporting; triage of accident and emergency cases.

The majority acknowledged that technology would influence the development of services, identifying the development of IT services to support Scotland wide reporting and the prospect of radiologists reporting from home. Opportunities will exist, but will be dependent on availability of funding.

Interview phase

Four of the eight participants who took part in the questionnaire section of the study agreed to take part in the interview stage. Three interviews were undertaken but the fourth could not take place due to pressure of work. The interviews sought to gain more in-depth understanding of the participants' perspectives within their own Health Board as well as their thoughts for the future of imaging services and the profession more widely.

Types of hospital

The type and location of hospital was described as important in the development of advanced practice. 'In our small district hospital we have tremendous advanced practice and that is because we grow our own skills. We don't have an excess of consultants or registrars on regular placements therefore we grow our own in order to manage the workload. Role development is based on service needs. In a teaching hospital there is a requirement for the radiologist specialist registrar to be trained as they are the Consultants of the future'. Another stated: 'if there are no radiologists on site for A&E reporting, the smaller departments do need the support of the radiographers'.

Challenges in implementing radiographer advanced practice

Interviewees stated there needed to be an effort to standardise implementation across Health Boards. For example the way that statistics are collected and utilised. 'In one place a percentage of the

Table 2
Reported benefits and drawbacks from the team based approach ($n = 6$).

	Benefits	Drawbacks
Staff members	Support from staff for APs and support for Advanced Practitioners from Radiologists Also shared knowledge Motivated staff, maximise potential, reduce costs Staff feel valued Personal development opportunities Good team ethos, peer to peer radiographic support with some role development	Not enough reporting radiographers in posts in order to be a fully integrated team Reluctance by some radiologists to accept need for radiographer reporting Staff become rigid in what they will and won't do Funding, maintaining skills and competencies Stress levels amongst staff higher than needs to be, as role development limited with no consistent clinical leadership in place
Patients	Speedier reporting of general radiography speeds up the patient pathway Timely reporting of plain film Reduces waiting time in Ultrasound Saves travel to mainland for some diagnostic tests-convenience Timely examinations, cost effective service	Some procedures require 'hands on' radiologist presence/input
Service delivery	Allows radiologists capacity to concentrate on more complex intervention and reporting, making better use of skills and knowledge Effective waiting times management. Single system approach to CT/MRI wait etc. (cross site waiting) Reduces waiting time When skills are available, local service delivery possible Good team work with use of skills as appropriate	Due to limited number of reporting radiographers; no contingency for leave or sickness Not enough time for CPD or peer review unlike other AHPs Small team – skill mix can change as staff come + go. Service locally depends on available skills – not always consistent Lack of clinical leadership makes delivery of clinical imaging service less effective

total reporting is used and in another, the percentage of musculo-skeletal is used'. Another said, 'there is not the degree of honesty and transparency over what people are reporting and from what sources. There is no like for like comparison'.

It was believed that there was no standardisation in the implementation of advanced practice with each Health Board doing its own thing. This could be due to 'some radiologists being for it and some being resistant. Some will have Board level support', and there is also a difference in how each Health Board views advanced radiographer practice. 'I don't think each Board has said OK we will invest this amount of money and it is essential to have that support'; 'support from above (ie Board level) you need that'.

Implementation of AHPDP plan for Scotland

The opposition of radiologists to radiographer image reporting has previously been described as an obstacle to radiographers undertaking image reporting, but this may be diminished as 'the younger cohort of radiologist are more amenable to work with radiographers and sharing parts of the workload', but it is acknowledged that '[radiographers] need the support of radiologists' to implement the change.

Fears were expressed for the advanced practice of radiographers if the plan is not implemented. 'It will have a very negative impact if we are not seen to achieve something through this plan'. If the plan is implemented there was also a fear expressed that 'radiographers may end up being given even more reporting, but not the interesting cases' and radiologists may be 'quite happy for radiographers to do more plain film reporting, but may only want them to pick the orthopaedic films already seen by consultants'. There may also be a 'constraint in radiographer training because it is easier to outsource than train somebody to grow their own skills'.

Radiographers can undoubtedly become competent to perform plain film and MSK reporting, but in order to do so 'you must have backfill to have them trained properly and you must put in quality monitoring ... and this has to be a national standard not a local Board standard. It is all do with time and money'.

The imaging service in 5–10 years (vision)

The interviewees all agreed there were opportunities in the near future and that radiographers should have a 'clear vision of the future which needs to keep evolving and changing focus'. The 'diagnostic service should not be seen as radiology as a whole'. The imaging service 'should be appropriately focussed to meet the demands of the hospital to ensure the hospital functions optimally'.

The vision should also be 'Scotland wide' with 'every Health Board involved, not left to individual Health Boards or radiologists as to whether they take part or not'.

Examples of working in different ways were described which could make the patient experience more timely and effective. 'Imaging is the pivotal diagnostic test; nothing happens without a form of imaging. If a patient can be examined and imaged at the same attendance as their initial consultation, then the effect that would have on the patient journey would be dramatic'. Comments were also made in relation to CT and MRI reporting, especially in the area of stroke imaging. 'We have a stroke unit, but radiographer reporting of the CT head was not embedded in the unit – but I will not rule out the fact that we won't revisit that'. Another interviewee stated that 'currently the radiologist reporting MRI scans is already over stretched and I do not rule out radiographer reporting in the future probably in 3–4 years' time.'

Radiographer skills

Considering how radiographers should utilise their graduate level skills, it was indicated that in imaging services, 'graduate radiographers should use their graduate skills within the service

immediately after graduation [and] the move towards advanced practice will be an expectation rather than opposed. In order to allow graduate radiographers to take on graduate duties, additional assistant practitioners will come into post to take over their previous tasks'. One interviewee stated, 'radiographers should really seize the moment and report on as much as they can. When a radiographer has the correct training, correct peer mentor in place they are probably better than some of the radiologists who are reporting some GP work'.

Resources

In order to get this job done, 'managers need training, support and resources. They are fire-fighting all the time. Government would be better investing more in diagnostics and we can get it sorted out, they can forget about it and we can run the service and get the job done'. It was also felt that the 'younger cohort of radiologists would be more amenable to share off parts of their role including more 'heavyweight' reporting.'

Seven day working was described as 'essential' for the future to 'deal with what comes in through the door'. In order to deliver the service, 'money needs to be spent to buy the best quality of equipment'. Additionally, investment was required in 'training and good leadership, and resources to get the job done.'

Concerns were raised for the health of staff and quality of service given due to the quantity of patients to be imaged. One interviewee stated, 'you need to work a little bit slower and you will find your quality improves tenfold.' Another ended with, 'happy patients, happy staff and the capacity I need to do the work. That would be the ideal.'

One interviewee described a clear idea of the future of their imaging service: 'in five years, three radiographers reporting MRI heads, knees, backs and IAM's. In addition, radiographers reporting plain films, GP chests and abdomens.'

Discussion

This work is the second phase of a larger study⁹ and considers the strategic insights of service managers with Board level responsibility. Response rates to both questionnaire and interview invitations were disappointing. The 57% return on the questionnaire is superficially quite good, however this should be seen in the context of the overall sample ($N = 14$) which amounted to the entire population. Interview uptake was particularly poor ($n = 3$), limiting the breadth of perspectives that could be explored. Despite these limitations, the data provides a unique insight and was extensive, providing detailed, useful information as well as enabling development of a valid overview. The interviews provided particularly rich insights and the findings identify enthusiasm for change at this level. Results indicate need for strategic managers to have time to step back and evaluate the services they provide within their area, be that rural or urban.

Implementing the 4 tier system and team work

There is disparity among the Scottish Health Boards in implementation of the 4 tier career structure for diagnostic radiographers. It was disappointing to note the lack of audit or research into service change being carried out generally, and by radiographers in particular, despite the necessity for both to evaluate changes in practice and maintain the professionalism of radiographers.^{16–18}

The majority of participants were aware of the joint Society and College of Radiographers (SCoR) and Royal College of Radiologists (RCR) 'Team Work' document¹⁸ and stated their departments followed these principles. The benefits and drawbacks in working with this model indicate there are frequently tensions between radiographers and radiologists when it comes to implementing

advanced practice for radiographers. It is evident that the radiology profession is able to exert influence over the profession of radiography, particularly in terms of how the scope of practice of the latter is enabled to evolve. Radiography is an independently regulated profession, therefore this situation is anomalous since the criteria for clinical decision and judgement making are expected to be evidence based. It is essential therefore that both professions work jointly to create a culture and environment that enables the aspirations in their joint document to be met.

More specifically, this situation leads to the reported scenario in some locations where existing radiographer skills are not utilised, thereby missing opportunities for valuable service enhancement. It is also recognised however that evolution of clinical work patterns needs to occur to support the use of these skills.

An additional barrier to radiographers taking on advanced roles identified was the permanent pay protection arising out of the implementation of Agenda for Change in Scotland. This has resulted in reluctance of some staff members to move into advanced roles where their salary might be reduced while taking on greater responsibility. This had led to opportunities for less 'senior' but enthusiastic practitioners leapfrogging into more advanced roles. Although this is technically a purely structural problem, it does have the potential to create difficulties within a department.

National imaging service vision

Progress to advanced practice was done very much from a local perspective with no cohesive national plan for supporting such change. Participants described the need for financial support for training staff and rewarding them for carrying out their new roles, hence enthusiasm was demonstrated for the AHPDP (2012) with its explicit reference to the development of radiographer reporting. This was seen as a national initiative implying support to staff and management, and hopes were high for success. Unfortunately in 2016, there seems limited evidence of generalised progress towards this goal, notwithstanding the contribution made by the 16.1 WTE reporting radiographers in post at the time of writing.¹⁹

Diagnostic imaging is a high demand element of diagnostic services and this is set to increase as a result of changing demographics, particularly the ageing population. Imaging services are under considerable strain due to the year on year increase in referrals, with those for CT, ultrasound and MRI of particular demand. Given the logistics of meeting anticipated need, it seems evident that working practices must change in order to sustain an effective diagnostic imaging service.

The results from this and the previously published phase of this study⁹ indicate that there are opportunities for radiographers to take on advanced roles. The success of such roles have been shown in previous research,^{11,20–22} however the pace of change in Scotland has been shown to be relatively slow and hampered by a variety of factors. The strategic service managers who participated in this study identified various possibilities where change could be beneficial, though this seems to be hampered in many cases by systems and attitudes that do not welcome or facilitate change. It is not clear how benefit to patients or indeed some of the scope of practice competencies required by the regulator, fit into this equation.

Strategic national perspective

Looking ahead, it was interesting to note a degree of optimism amongst many participants. Focussing on improved outcomes and constructing arguments that were centred on the 'right thing' for patients was important in gaining support or acceptance. It was important however to recognise the need for strategic vision and this could be constrained by the basic requirement to ensure day to

day delivery. Having the opportunity to step back and look at the wider picture was challenging. The localised and inconsistent nature of developments shown, in the context of a desire for more coherent implementation, suggests that a national review of imaging services across Scotland is indicated. This may establish specific hurdles and issues that create misalignment with some of the best practice experiences seen elsewhere in the UK.

The data suggest that not all voices are fully heard in discussions around service evolution. In planning for the future therefore it is important to ensure that the 'team working' approach advocated by the SCoR and RCR¹⁸ is applied in order to best use the whole range of expertise available and encourage positive engagement by all professional groups, particularly the radiological community.

Conclusion

Strategic managers demonstrate commitment and motivation to move their services forwards in line with wider priorities. They demonstrate optimism regarding the 'direction of travel' of diagnostic services. There are however a variety of practical and cultural obstacles in place that create substantial difficulties in enabling progress. These include funding and employment conditions but also quite significantly, the attitudes and actions of professionals themselves.

The relationship between the professions of radiography and radiology is a major factor which is linked to historical notions of medical dominance or even patriarchy. This is demonstrated through recent pronouncements by the RCR on the practice of radiographers that would be considered unprecedented and unacceptable in other disciplines²³ and a pre-occupation with a radiological rather than a whole service perspective on seeking solutions to existing and emerging issues.²⁴

A national review of imaging services would provide a useful baseline for the identification of inconsistency nationally and locate examples of effective service enhancement. It would also enable clear articulation of the evidence base that should inform strategic decision making. This must be seen in the context of change that has taken place since the original data was collected. For example, with regard to image reporting, the increased use of third party reporting services has provided incentives for some radiologists to resist increased deployment of radiographers in reporting roles. This could be seen as controversial and in direct conflict with Health Service imperatives to maximise cost effectiveness.

Achieving useful service evolution is a complex process with multi-factorial challenges. There are undoubtedly wins and losses along the way, however placing service quality and patient benefit at the centre of everyone's thinking should help ensure the correct direction of travel.

Conflict of interest statement

None.

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