

Development of sonography practice to accelerate patient care

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Abstract

Introduction

Sonographers in the United Kingdom (UK) are expanding their scope of clinical skills in order to alleviate long patient waiting lists, but many are experiencing challenges to accessing appropriate training opportunities to acquire new skills (BMUS, 2021). To facilitate this, the University of the West of (UWE), Bristol, secured funding from National Health Service, England (NHS E), to undertake a project in which sonographers were trained by specialist practitioners to further develop their clinical skills to encompass interventional procedures.

This training opportunity was offered to sonographers working within the Southwest of England and was evaluated by a research team at UWE. Alongside this training, perspectives on challenges, barriers and opportunities to extend and develop skills of practice were explored. The specific project aims were:

- Organise practical workshops at UWE, led by specialist practitioners.
- Provide each participant with an opportunity to link with a clinical expert mentor and encourage them to spend time working together with their mentor in clinical practice.
- Enable participants to also have the opportunity to obtain academic credits for their learning, by completing an assessed academic module at UWE.
- Compile a Register of Mentors with specialist skills, providing contact details for sonographers to contact for advice / guidance on how to enhance their scope of practice and how to establish new services within their departments.
- Explore the current position of sonographers and departments who want to develop their clinical skills in areas such as interventional procedures to accelerate patient care.
- Investigate the potential barriers, challenges and opportunities that exist for sonographers and their departments who would like to enhance their scope of practice and be able to offer additional diagnostic/therapeutic services.
- Explore with participants the outcome of their training, and whether new services are being offered by them as a result.

Method

Workshop participants were invited to take part in two interviews, one prior to the workshops and a second three months post workshop. Mentors and managers were also invited to participate in an interview at the second timepoint.

Results

A total of 35 participants took part in semi-structured interviews between January and June 2024; participants included workshop attendees (n=15), mentors (n=14) and departmental managers (n=6). Several themes developed from the data, the primary ones relating to difficulties accessing training due to a number of reasons which are explored in more depth in this report.

Findings

Several themes developed from the data, the primary ones relating to difficulties accessing training due to a number of reasons which are explored in more depth in this report. The key themes were:

- Theme 1: Clinical pressures vs developing new skills: the ethical and moral dilemma
- Theme 2: The need to prove yourself: passion, drive, confidence, resilience
- Theme 3: Appropriate support from key people: support from a radiologist is almost always needed
- Theme 4: Lack of professional identity: mosaic pathways and training
- Theme 5: Practical constraints: finances, space and isolated working
- Theme 6: Overcoming the fear of change and paving the way for others

Conclusion

A number of recommendations were made to ensure that sonographers attain the skills, confidence, and the opportunities required for them to be able to move into enhanced scope of practice roles in the future.

Whilst it is recognised that the findings from this study may not resonate with all sonographers and ultrasound departments, the comments and the themes represent the lived experiences of the interviewed participants. Further work is therefore needed to establish whether the issues raised here are specific to the study participants, or are shared by other sonographers and their departments, and hence of wider relevance. Current research in the area is limited, and further information is required to establish what can be done to help alleviate the challenges facing sonographers when progressing through their careers.

Introduction

In July 2023, NHS England (NHS E) commissioned the University of the West of England, Bristol (UWE), to undertake a project to further develop sonographer skills, and enable them to expand and enhance their fields of practice.

Sonographers in a number of ultrasound departments in the UK are developing their clinical skills in interventional procedures in order to alleviate long patient waiting lists. To facilitate this more widely, many sonographers will require additional training to acquire new skills. Clinical sonographers are well placed to enhance their practice, and establish new and innovative approaches to imaging, diagnosis and therapeutic treatment.

Initial discussions took place with a number of relevant stakeholders, people and organisations, in order to explore how best to enable sonographers to develop their clinical skills in areas such as interventional procedures. These included representatives from a number of professional bodies (Society and College of Radiographers [SCoR], Consortium for Accreditation of Sonographic Education [CASE] and Chartered Society of Physiotherapy [CSP]), sonography superintendents, radiologists, consultant sonographers, sonographers with both radiography and physiotherapy backgrounds in England. The plan for the project gradually evolved during and following these exploratory discussions.

To enable development towards enhanced scope of practice, sonographers will require additional training and guidance to gain new skills and knowledge. It was generally acknowledged that acquiring these new skills requires a very hands-on practical method of training. UWE therefore organised two workshops which were led by specialist practitioners, using ultrasound equipment, phantoms and anatomical models. Each student was then provided with an opportunity to select a clinical expert mentor, and were recommended to spend time working together with their mentor in clinical practice.

Background

The use of ultrasound in medicine began during the Second World War in various centres around the world. The work of Dr Karl Theodore Dussik in Austria in 1947, on ultrasound investigation of the brain, provides the first published work on medical ultrasonics (Meire and Farrant, 1982).

Professor Ian Donald and his colleagues in Glasgow in the mid-1950s, did much to facilitate the development of practical technology and diagnostic applications (Shirley *et al*, 1978). This led to increasing use of ultrasound in medical practice in subsequent decades. From the mid-sixties onwards, the advent of commercially available systems allowed the wider dissemination of this diagnostic technique (Hoskins *et al*, 2003).

Technological advances in electronics led to a rapid expansion in the diagnostic applications of ultrasound. This growth in the use of ultrasound as a diagnostic imaging tool has led to a demand for a workforce with the appropriate skills to perform and interpret the scans. Prior to the 1970s, on the rare occasions when ultrasound examinations were performed in the

United Kingdom (UK), these were generally carried out by medical doctors (Baker, 2005; Hart and Dixon, 2008).

By the early 1980s the largest group of professionals working with ultrasound was radiographers (Meire, 1986). The Society of Radiographers (SoR) introduced a training programme for radiographers in 1977 which led to a Diploma in Medical Ultrasound. This continued to be offered until it was replaced in the early 1990s by a postgraduate higher education institution (HEI) based qualification (MSc/PgDip/PgCert) open to all healthcare professionals (Price, 2010).

Gradually the technique moved away from the preserve of medical practitioners, as other healthcare professionals from varying backgrounds began to perform the scans, and it became known as 'sonography' (Society and College of Radiographers [SCoR], 2009). This multidisciplinary development of sonography practice has been driven by clinical need and has resulted in a range of professionals now providing the service (Lee and Paterson, 2004). However, medical doctors have tended to retain control of areas perceived to be more complex (such as MSK) or more interventionist procedures (such as biopsy or cyst drainage) (BMUS 2021).

Although there are many practitioners using ultrasound as a diagnostic tool to support their professional role (such as physiotherapists), those individuals whose primary role is to produce and interpret ultrasound images are generally known as sonographers, to identify their specialist skills in the area (SCoR, 2009).

By the beginning of this century, ultrasound had become the most widely used diagnostic imaging technique throughout the world (Baker, 2005). In the UK, ultrasound investigations now comprise over twenty three percent of all diagnostic imaging examinations (NHSE 2024). However, there remains no statutory regulation of the practice of sonography in the UK. Although the majority of practitioners are regulated as professionals in their primary area of practice, there are many working in the field who are not regulated by any professional body as they are not AHPs, nurses or doctors (Edwards, 2010).

Within the UK, extended waiting lists for sonography examinations persist, a situation further compounded by the repercussions of the COVID-19 pandemic. There were 45.9 million imaging tests reported in England during the year from December 2022 to November 2023 (NHSE, 2023). Of these, 22.1 million were x-rays, 10.6 million were diagnostic ultrasound, 7.3 million were CT, and 4.2 million were MRI scans. When looking at the Diagnostic Imaging Dataset (which includes inpatient, outpatient and emergency examinations), this demonstrates that the median number of days between the 'date of test request' and the 'date of test' was 0 for x-rays, 15 for ultrasound, 1 for CT and 20 for MRI (NHSE, 2024).

However, the true figures for non-obstetric ultrasound procedures are undoubtedly higher, as the majority of scans are for obstetric patients who receive their scans at defined times during their pregnancy, which reduces the overall average wait for an ultrasound scan. The percentage of people waiting for non-obstetric ultrasound tests/procedures in England after

six weeks of request for diagnostic test/procedure increased from an average of 0.5 per cent between 2008 and 2013, to an average of 1.0 per cent between 2013 and 2015. This indicates that the service is declining in efficiency (CfWI, 2017).

An Ultrasound scan of the abdomen and pelvis to diagnose ovarian cancer is one of three of the key tests which were outlined in *DoH Improving Outcomes: a Strategy for Cancer*, and any delay to access of these examinations leads to poor prognosis for patients (DoH, 2011).

Nevertheless, there exists a nationwide shortage of specialists to fulfil these specialised roles. In 2022 there was a 29% shortfall of clinical radiologists, and this is expected to increase to 40% in five years without action (RCR, 2023). Clinical sonographers are well placed to develop their roles by acquiring specialist skills and competencies, and to curate new and innovative approaches to imaging and reporting. To enable this however, additional training is essential for sonographers to enable them to acquire the necessary skills and knowledge. The UK sonography workforce is not alone in facing these challenges, with a recent report from Australia highlighting that significant problems exist internationally. One of their recommendations was that there needs to be more opportunities for work integrated learning and that this needs to be appropriately resourced and regulated (Edwards *et al*, 2024).

The practice of ultrasound imaging is more commonly known as sonography or ultrasonography. However, in the UK, there is a distinction between a 'sonographer' and an 'ultrasound practitioner' as defined by the Royal College of Radiologists (RCR) and the Society and College of Radiographers (2014). So, while all ultrasound practitioners perform sonography, not all ultrasound practitioners are sonographers. Detailed explanations of both are discussed in the current practice section of the report. Throughout this report both terms are used in the context defined by the RCR and SCoR.

The RCR and SCoR definition of a sonographer (RCR/SCoR, 2014) excludes General Medical Council (GMC) registered doctors but includes non-GMC registered doctors; a healthcare professional who undertakes and reports diagnostic, screening or interventional ultrasound examinations will hold qualifications equivalent to a postgraduate certificate or post graduate diploma in medical ultrasound that has been accredited by the Consortium for the Accreditation of Sonographic Education (CASE). They are either not medically qualified or hold medical qualifications but are not statutorily registered as a doctor in the UK (CfWI, 2017).

Over the past 25 years the range and complexity of ultrasound imaging has rapidly evolved, which has led to changes in the way that these services are delivered (Miles *et al*, 2022; Clarke *et al*, 2024). New imaging modalities and interventional procedures in radiology have resulted in increasing use of skills-mix in most ultrasound departments. Workforce shortages of radiologists has driven an increasing requirement for sonographer role development. The role of the sonographer continues to evolve with many sonographers now undertaking increasingly complex and/or interventional procedures as part of their everyday practice (BMUS, 2022)

Lindquister *et al* (2024) report that the volume of interventional radiology (IR) procedures performed by practitioners such as physician associates (PAs) and nurse practitioners (NPs) increased between 2010 and 2021. Researchers found a 142.9% increase in the volume of peripherally inserted central catheter (PICC) placement, paracentesis, and thoracentesis for NPs and a 66.7% increase for PAs for the study time frame, and these percentages may be underestimations. They also report that this results in cost savings for departments and frees up radiologists to perform more complex procedures.

There are various opportunities available for sonographers and sonography practitioners to develop additional and/or more specialised areas of clinical practice through HEI ultrasound programmes, by the completion of additional clinical modules. However, there is a shortage of local work-based training and development opportunities to facilitate sonographers taking-up additional learning opportunities (Miller *et al*, 2024). One of the recommendations from a recent report was that there needs to be more opportunities for work integrated learning and that this needs to be sustainable and equitable to ensure effectiveness (Edwards *et al*, 2024).

The Project

Following initial discussions with a number of relevant people and organisations to explore how best to enable sonographers to extend their practice, the project evolved into a number of strands and stages:

1. Organise practical **workshops** at UWE, led by specialist practitioners
2. Provide each participant with an opportunity to link with a **clinical expert mentor** and encourage them to spend time working together with their mentor in clinical practice.
3. Enable participants to have the opportunity to **obtain academic credits** for their learning, by completing an assessed academic module at UWE
4. Compile a **Register of Mentors** with specialist skills, providing contact details for sonographers to contact for advice / guidance on how to enhance their scope of practice, and how to establish new services within their departments

It became apparent during discussions and planning for the workshops that many departments and sonographers were keen to extend their sonography practice and services offered but were unable to take advantage of the funded workshops due to a number of reasons. It was therefore decided that, alongside the above 4 stages, a research project would be undertaken to explore in more detail the reasons behind the challenges facing sonographers and their departments when trying to develop their practice and extend the services offered.

Aims of the research project

1. To understand the current position of sonographers and departments who want to develop their clinical skills in areas such as interventional procedures to accelerate patient care.
2. To understand the potential barriers, challenges and opportunities that exist for sonographers and their departments who would like to enhance their scope of practice and be able to offer additional diagnostic/therapeutic services.
3. To explore with each participant the outcome of their training, and whether new services are being offered by them as a result.

It was proposed that the project will be monitored longer term to establish any challenges encountered, to identify opportunities for further development, and to quantify the impact on clinical practice within the Southwest (SW) region.

Hands-on training workshops

Acquiring new sonographic skills requires a very hands-on method of training. UWE therefore organised themed workshops facilitated by experienced expert practitioners. Two workshops were held which used ultrasound equipment, phantoms, and anatomical models.

The workshops were available for practising sonographers. Participants had the opportunity to listen to experts sharing their experiences and knowledge, and to practise techniques under guidance using ultrasound equipment and phantoms.

The workshops were promoted via notices in professional journals; contacting professional bodies to inform them; approaching clinical colleagues; and via social media. To facilitate the mentoring scheme, a register of potential mentors with their specialty area and contact details was created; these individuals agreed to be available by phone or email to provide guidance and help with queries for the participating sonographers.

The two workshops were held at UWE, Bristol. The content of these workshops consisted of lectures and opportunities to practice techniques on phantoms using ultrasound equipment:

- **General biopsy and drainage workshop** was held on Thursday 1st February. The workshop included biopsy, fine-needle aspiration (FNA) (head & neck), cyst drainage, paracentesis.
- **MSK joint injection workshop** was held on Friday 2nd February. The workshop included shoulder, elbow, hand, knee and foot.

Following attendance at the workshops, each sonographer was then provided with the opportunity to be paired with a clinical expert mentor with the relevant expertise, and to spend time working with their mentor in clinical practice. This could be either within the participant's department or the mentor's.

Some clinical areas such as Hystero-contrast sonography (HyCoSy) do not lend themselves to classroom teaching due to the difficulties encountered in obtaining suitable models and

phantoms. Any sonographers wishing to gain skills in these areas were therefore paired with mentors who offered to spend time with the sonographer in their department teaching and supervising using actual patients, or have the sonographer spend time in the mentor's department.

Participants were also offered the opportunity to progress at a later date, to obtain academic credits for their learning, by completing an assessed academic module at UWE where the specialty subject can be negotiated with the ultrasound course leader, and theory / practical assessments undertaken to confirm competency. This Negotiated Specialist Practice module could be either a 15 or 30 credit module, depending on the breadth and scope of the area studied. All training was fully-funded and no academic costs were incurred by students.

Methods

Study design

A descriptive phenomenological approach (Robson, 2002; Shefaly & Esperanza, 2022) was used to investigate the 'lived experiences' of key participants, which focused on the challenges facing sonographers and their departments when trying to expand their scope of practice.

Recruitment

The funding for the project was intended for sonographers based in the SW region of England and was also available for sonographers working in the private sector in the SW where NHS contracts are in place. Workshop participants were also provided with the opportunity to obtain academic credits for their learning, by completing an assessed academic module at UWE. All training was fully funded, and no academic costs were incurred by students.

Invitations were extended via email to all ultrasound departments and sonographers in the SW to inform them about the fully funded opportunity and the workshops. Articles were placed in the College of Radiographers (CoR) journal, in Radmagazine and on the Chartered Society of Physiotherapy (CSP) Southwest Regional Network. Notices were also placed on social media platforms. Those interested in taking advantage of this opportunity, were asked to contact the project lead for further information.

All attendees of the planned workshops and their mentors were then sent an email inviting them to participate in the research, together with a participant information sheet (PIS) (see Appendices 1 & 2), and a privacy notice (see Appendix 3). Once they had agreed to participate, they were sent a consent form (see Appendix 4). The attendees also received a separate email to forward to their department managers, which included a PIS, privacy notice and invitation to participate (see Appendix 5). Alternatively, if department managers were known to the research team, they were emailed directly. It was made explicit that there was no compulsion for the individual to participate in the research, and that they could

withdraw from the research at any time. Each potential workshop participant received an initial email and two reminders before communications relating to the research were stopped. Each PIS provided the aims of the study, an overview of what was involved, and details of who to contact for further information.

Once potential participants had received the invitation to participate, the PIS and privacy notice, they then had the opportunity to ask any questions about the study via telephone or email. Participants who indicated they wished to take part in the project were asked to complete the online Qualtrics consent form prior to the interviews. Verbal consent was also audio-recorded at the start of the interview. If for any reason, participants were unable to complete the online consent form, verbal consent had to be obtained and audio-recorded at the start of the interview.

Purposive sampling was used to recruit a diverse sample of 15 workshop participants, 14 mentors and 6 department managers with relevant experiences, backgrounds and roles. A pragmatic approach was adopted, and this sample size was considered to be sufficient to allow a rich understanding.

Data collection

Purposive sampling took place by inviting workshop attendees to be interviewed, plus mentors and managers. These were considered to be the most appropriate participants with relevant experiences, backgrounds and roles, thereby ensuring a useful depth of insight would be obtained. In total, 35 semi-structured interviews were conducted.

The interviews were conducted by two experienced qualitative researchers from UWE using a topic guide developed by the research team (Appendices 6,7,8). All interviews were conducted at a time convenient to the participant, via telephone or Microsoft Teams to minimise time, travel, and safety demands on the participants and the interviewer. Where participants were in agreement, the interviews were recorded using the record function on Microsoft Teams.

The topic guide questions were designed to gain an understanding of individual experiences and views on:

- current position of sonographers and departments who want to develop their clinical skills in areas such as interventional procedures to accelerate patient care.
- the potential barriers, challenges and opportunities that exist for sonographers and their departments who would like to enhance their scope of practice and be able to offer additional diagnostic/therapeutic services.
- the outcome of the participants' training, and whether new services are being offered by them as a result

In addition, the interviews explored professional backgrounds, experience, professional development, including enablers, barriers and opportunities that had helped or hindered

their career development. The interview at the three-month stage after attending the workshop, also explored any new services that had been implemented as a result of the workshops, or any other outcomes.

The inclusion criteria for participants related to individuals who had participated in the workshop, those on the Mentor Register list, plus department managers.

The majority of interviews were with participants based in SW England, however, mentors tended to be based in various parts of the UK due to the overall paucity of availability of mentors with the appropriate skills. This helped to shape some of the themes within the research study.

Data analysis

The Microsoft Teams Transcription function was utilised. All transcripts were read, checked for accuracy, and anonymised. Before importing to NVivo 14 software, each transcript was given a unique ID. Thematic analysis was employed and Braun and Clarke's six step data analysis process was followed in an iterative manner to understand the data and identify themes (Braun *et al*, 2022).

Data Protection and management

The researchers created a data management plan to ensure all data was collected, handled, and stored in compliance with the General Data Protection Regulation (GDPR) (EU) 2016/679, the Data Protection Act 2018, and UWE policies. Participants received a PIS and a privacy notice informing them about the management of their data throughout the study.

Electronic files were securely stored in a restricted UWE OneDrive folder accessible only by the designated research team members. Documentation containing personal and sensitive data was password protected. Research data was pseudonymised upon collection. Microsoft Teams' record function was utilised for interviews, with files promptly transferred to the protected OneDrive folder. Recordings were transcribed verbatim and anonymised by the study team, followed by the deletion of audio recordings.

Hard-copy data was stored at the University of the West of England in a fireproof, lockable filing cabinet. Identifiable information in hard copies will be securely destroyed when no longer needed by the research team. The 3 project researchers were the only people with access to the data.

Confidentiality and anonymity of the respondents was deemed to be crucial, and the researchers ensured that individuals could respond fully without being identified or linked to their institution. Participants were informed that quotations may be used as examples but would not be attributable to individuals. They were also informed that they would be free to withdraw from the study at any time.

Ethical considerations were paramount throughout the research process. The research team were guided by ethical principles, and ethical approval was obtained for the study from the

Findings

A total of 35 participants took part in semi-structured interviews between January and June 2024. Participants were workshop participants (n=15), mentors (n=14) and departmental managers (n=6), although three workshop participants were also mentors for other specialities. One workshop participant did not respond to the invitation to participate in the second interview. Figure 1 displays the professional backgrounds of the participants and demographic data is displayed in table 1. The mean interview duration was 22 minutes with a range of 8 minutes to 54 minutes.



Figure 1. Participant professional backgrounds

Table 1. Participant demographic data.

Age	Mean age = 45.2 years* Range = 28 - 59	*n=29, six participants did not provide their age
Gender identity	Female, n=23 Male, n=9**	**n= three participants did not provide their gender
Race/Ethnicity	White British, n=27 Indian Asian, n=1 British Asian, n=1 Mixed White, Italian, n=1 Black African, n=1 Chinese, n=1***	***n= three participants did not provide their race/ethnicity

Following thematic analysis of the interviews, six interconnected themes were identified, providing an insight into the current position, challenges, and opportunities for sonographers wanting to extend their practice. Additionally, two descriptive themes were developed to capture the impact and opinions on the workshops and mentor register. A visual representation of these themes is presented in Figure 2.

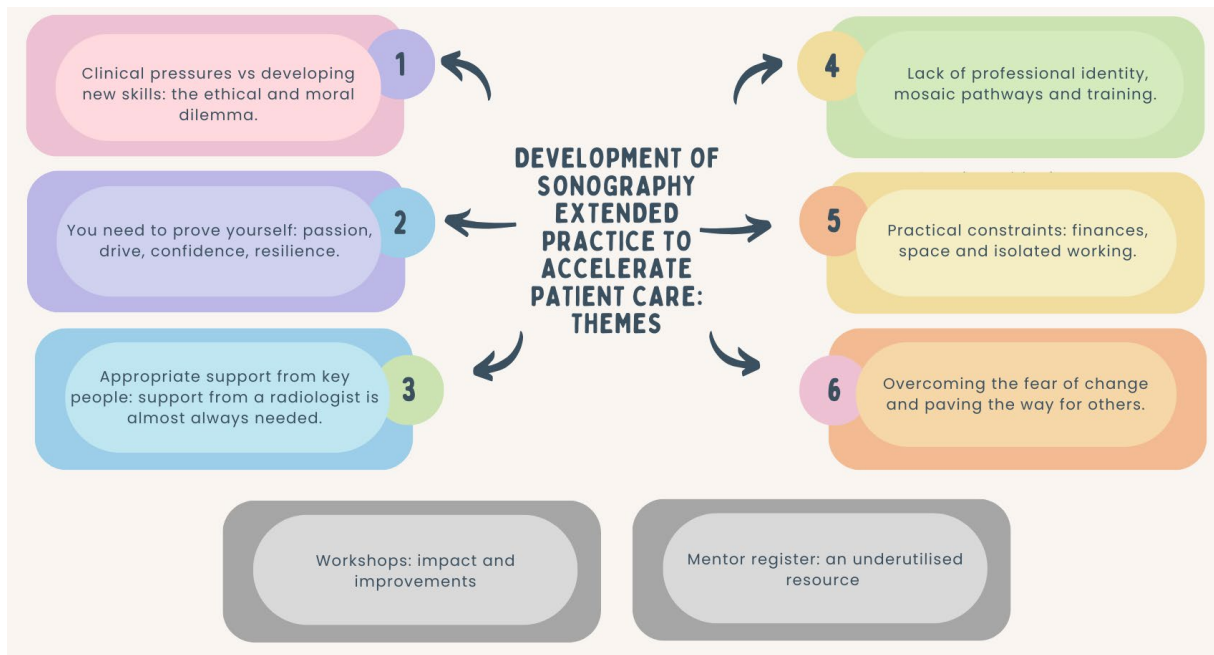


Figure 2. Themes.

Theme 1: Clinical pressures vs developing new skills: the ethical and moral dilemma



Balancing the development of new skills for sonographers and the daily clinical workload pressures, was a highly discussed area, particularly when departments are currently facing challenges with recruitment, sickness and workforce burn out. The current climate for the NHS is one of high pressure and multiple challenges, particularly with an increasing and ageing population.

Many sonographers and their departments feel the constant ethical and moral dilemma of supporting sonographers to enhance their scope of practice while managing the demands on waiting lists; this is particularly difficult when identifying staff backfill is not always possible. Staff retention and recruitment seems to present more of a challenge in remote geographical areas.

'Over the last few years we've had chronic staffing issues that have led to us really having to live week by week and try desperately to keep the ship afloat and it's taken a while to build up a level of consistency and start to get morale back on an even keel and on top of that we're doing a lot of student training this year which is putting extra pressure on the staff.' – Participant 22

'Releasing people for training is impossible when your workforce is burnt out and sickness is high and you're constantly just trying to cover the bare bones.' – Participant 10

Alongside the challenges of releasing sonographers for training, is the constant pressure for those currently training, or already working at an enhanced or advanced practitioner level, to return to the more general scanning procedures due to clinical demand. Those working in specialist areas such as musculoskeletal (MSK), which includes a wide range of anatomy, already face challenges in maintaining their skills due to the breadth and complexity of this specialty area.

'If you're not doing it, you can read all the books you can, look at all the pictures, but without physically doing it, you're not getting that muscle memory, and it's been tough. I'm not gonna lie.' – Participant 4

The challenge in supporting sonographers to gain additional skills to enhance their practice has caused feelings of frustration, neglect, dissatisfaction, under-appreciation and the perception of being a burden on their colleagues. This has led to several participants applying for roles at other trusts. Similar feelings were described by those who had completed their training and achieved a promotion or a new role; with the challenges in recruiting new staff, some are still supporting their previous work to ensure standards and provision is maintained.

'I really need to be doing a morning or one afternoon a week in MSK to keep my skills up and then every time there's a shortage of staff, you get pulled back and I think that's been the key issue.' – Participant 13

'There are so many people who are so well qualified here that want to do more, and we're just told bums on seats, got to do the basics.' – Participant 7

Covid-19 was cited as an accelerator for current pressures, but not necessarily the cause. One participant described the initiative and financial benefit of one department working overtime to reduce waiting lists pressures following the pandemic.

'Our waiting lists are very good because we had a big rally just after Covid. My boss put forward an initiative, so we could do some overtime and just get the list down, and that's what we did.' – Participant 4

Many acknowledged how beneficial it would be to plan ahead, have progression plans in place for staff and to think strategically about succession planning, however, shortage of time, due to clinical pressures, remains a barrier.

'There is no time to just think strategically, to think what is our service going to need in five years or ten years' time. People are so busy.' – Participant 33

Theme 2: The need to prove yourself: passion, drive, confidence, resilience

Most participants cited their line managers as being supportive but, despite this, obtaining additional skills was largely driven by individual sonographers and their ability to demonstrate benefit to the department (reducing waiting lists, thus improving patient care, plus financial savings). Regardless of these undoubted benefits for the departments, many sonographers had to seek alternative training, often in other locations and outside of working hours. This proves even more of a challenge where a department does not already provide the specialities that an individual would like to gain the skills for.



'I put all their finances together, how much the cost saving or how much it would cost to train me.' – Participant 1

Many reflected on their own experiences of training, and once post-qualifying, the onus is on the individual to complete CPD in their own time due to limited time available during working hours.

'I think once you're at postgraduate level, the onus is on you....and even CPD is mostly done in our own time realistically because it's very rare that you'll get time, I maybe get one or two half days, a year maybe to do CPD.' – Participant 13

There is a feeling of either having to create their own opportunities or making a deal and compromising to get the support they need to acquire new skills. An example of this is one participant leaving their trust and seeking locum work until they made connections with people who could support them in MSK scanning and injections. Creating these opportunities can often come with a risk, financially and with the lack of guarantee that support can be identified. Sonographers also need to ensure that they do not become deskilled by not being able to practise, so not only do opportunities need to be sought, but they need to be continued.

'You have to almost demand support and have that voice. Don't sit around and wait for opportunities to come your way - go and find them. Go and learn. Always be learning. So, I think it's probably mostly come from myself, not come from formal service demand and management structure.' – Participant 3

Many participants highlighted that they had to spend their own time developing agreements, scope of practice and job descriptions before they're even considered for training, an increase in responsibility or an increase in pay. Time can be a challenge for any individual, but this can be even more difficult for those working part-time and who have caring responsibilities; additional time outside of work cannot always be dedicated to gaining new skills. It was also noted that perhaps not all sonographers want to extend their practice, and this route may not be suitable for all because of the time demands.

'I think we do a really tiring job as well. So, the thought of doing extra study outside of that, it takes a bit...it's determination and drive.' – Participant 35

One participant highlighted that although career progression and acquiring new skills may rely on passion, drive and determination, individuals should be mindful of the language and actions used to achieve this. It is important for progression and satisfaction to maintain and develop healthy working relationships between all professional groups.

'An issue amongst non-medical people who are looking to extend their practice is sometimes using quite inflammatory language. And pushing themselves forward quite aggressively. Which is not helping, which is not going to lay the path for relief, for a healthy relationship between different professional groups.' – Participant 33

Theme 3: Appropriate support from key people: support from a radiologist is almost always needed



Career trajectory and the acquisition of new skills primarily seemed reliant on the support from radiologists within departments. Many have experienced supportive radiologists, who have provided mentoring and training in all specialities, but others have experienced barriers and challenges which has greatly impacted ~~extension~~ development of roles.

'If I'm honest, no matter how much people want to do their role extension, it is down to your local radiologists. If you don't have the support of your local radiologist, you won't be able to budge an inch. You can have the passion and the drive and everything you possibly want, it isn't gonna make a difference. Which is frustrating.' – Participant 28

Many of the mentors and workshop participants who have already successfully navigated the pathway to enhance their practice described how vital the support from a radiologist was. However, nearly all described feeling fortunate with having a supportive radiologist in their department, as they were aware this was not always the case.

'Relationships between sonographers and radiologists in my trust is really good. They're very approachable. They are happy to teach.' – Participant 6

The support often relies on radiologists' views on sonographers extending their practice. The impact of one individual can immensely influence the culture of the department and the development of sonographers. Often, it may only take one radiologist to not be supportive, to cause a barrier. Development can be reliant upon having the right person, in the right place at the right time. If the support is limited, participants felt that it would be easier to leave the department and find opportunities elsewhere rather than challenge their views.

'Having the right radiologists in the right positions at the right time because they all rotate as clinical director, they will take it in turns and you kind of have to wait for a radiologist to come through that thinks that an advanced practice or extended scope of practice role is a good idea.' – Participant 20

The perceptions of participants when discussing lack of support tended to arise from the protection of the radiology profession. Reasons for the lack of support tended to be due to prioritising radiology registrar training; protecting their workload, as private practice (for MSK especially) is very lucrative; not wanting to stop practising ultrasound themselves; concerns over patient safety. There appears to be anxiety from radiologists about ensuring patient safety and a good level of training. These challenges seemed to be further heightened in smaller hospitals, where radiologists had been working for many years. Initial hesitation from radiologists seems common where there are no examples of successful training in the trust previously. This has been overcome in some instances with good open communication, demonstrating the benefits to departments, staff and patients.

'It's trying to make sure that the radiologists know we're not trying to take away their role. We're trying to just offer our patients the best care, and reduce waiting lists.' – Participant 17

However, MSK is a particular area that is seeming to receive a lot of resistance, due to the opportunities for private practice work and the complexity of the area. A small number of participants also felt that some advanced level sonographers were becoming equally protective over their skills.

'I think the consultants that are involved are sort of pretty keen to keep hold of that work [MSK]. My understanding is that it's very lucrative for them in private work and various things on the side. They've got no real incentive to develop and change that workload or to train additional people.' – Participant 3

Opportunities can also depend on areas where there are gaps or an increased demand in services, either due to a staff shortage or perhaps that radiologists do not have a particular interest in. This included areas such as head and neck FNAs. In these circumstances, sonographers are supported and encouraged to acquire new skills.

'I'm lucky because we had a shortage of radiologists and the majority radiologists have had an interest elsewhere other than ultrasound, so there's been a natural vacuum.' – Participant 16

"So, role extension can exist in bubbles in the stuff that radiologists don't want to do.' – Participant 28

In some cases, participants have been restricted in what they can practise, due to a change in the radiology team and their prior experiences and beliefs. This is despite participants completing training previously which clearly demonstrated competency and being able to practice autonomously.

'The radiologists that had been so supportive left and the next radiologist that came in had never seen the sonographer doing anything like that before and was very anti me being anywhere near doing them.' – Participant 29

Recent concerns regarding Physician Associates and the BSIR (Nov 2023) statement has also impacted other professions in radiology, including sonographers. Participants reported that since this statement was released, radiologists have become much more wary about sharing aspects of their practice and some have actively stopped sonographers from progressing.

'Since the statement from the RCR and the BSIR came out in November about physician associates and non-doctors in interventional radiology, I haven't done a paracentesis. I'm no longer allowed in interventional radiology.' – participant 10

'For the time being I have completely abandoned intervention work, which is a real shame as I enjoyed it a lot and for a long time that's where I saw my career going. But, as I see it, there's no point in pushing at a closed door'. – participant 10

Despite the perceptions of radiologist protecting their profession, it was also recognised that historic views about radiologists may be causing barriers, particularly when inflammatory language is being used.

'I think there's quite a lot of inflammatory language and there's quite a lot of trying to lay boundaries around turf and these turf wars are, I think, probably the major problem at the moment in terms of role extension... I think there's a concept that our radiologists are the enemy and perhaps we need to sort of get over that.' – Participant 33

It is also important to highlight that despite the perception that some radiologists are attempting to protect their profession, there are often practical barriers such as time, availability and finances. Many participants alluded to the amount of time that training and clinical experience can take up, both for the trainee and trainer. Considerations such as annual leave and sickness also impact the amount of time radiologists can dedicate to training sonographers in their department. Radiologists will prioritise radiology registrars and their own workload, before considering training sonographers. However, some participants explained how sonographers can be utilised in registrar training, and described how this has worked well as a bargaining tool in departments.

'It disrupts their workflow a lot, and it's quite intensive teaching anyone in ultrasound anyway because it's very hands on.' – Participant 5

It was suggested that more evidence to demonstrate the clinical benefit and cost effectiveness of enhancing the scope of practice of sonographers would help gain the support of radiology departments.

'If research is out there showing that it is clinically and cost effective to do that, then it's hard for radiology departments that may be entrenched in their views to justify them really.' – Participant 17

Theme 4: Lack of professional identity: mosaic pathways and training

A regular challenge cited was the lack of identity for sonography as a profession, particularly as there no registrant body for the profession and the term 'sonographer' is therefore not a protected title. Varying professional backgrounds provide their own individual challenges, but the lack of recognition for being an autonomous practitioner was highly cited.



'I don't think there's a recognition out there that we're autonomous practitioners...The lack of knowledge about what we do in the wider clinical world is hard.' – Participant 21

The lack of identity and differing professional backgrounds can lead to fragmented pathways for sonographer development and impact an individual's journey throughout extending practice. Networks, connections, funding opportunities, training pathways, guidance and job descriptions tend to differ amongst professions and between trusts. Differences in regions were also highlighted.

'I think [location – outside of the South West] has always been a more progressive area within sonography than most of the rest of the country, and certainly the South has always seemed to be much more reluctant to allow sonographers out of their box.' – Participant 30

Many radiographers have been leaning towards achieving advanced practice accreditation but highlighted that they were aware of many sonographer colleagues using the term without having the appropriate accreditation in place. Terminology has also caused confusion, particularly between advanced practitioner and advanced clinical practitioners. Achieving an advanced clinical practice level for some has been a challenge because of difficulties in evidencing competencies, and the varying professional backgrounds means it is not the same route for all. There are additional difficulties with some professions only being able to qualify as supplementary prescribers, whilst other can qualify as independent prescribers. Those aspiring to work at consultant level also present a challenge, as they are often expected to achieve a doctoral level qualification or be working towards one. Funding opportunities are complex and often very competitive.

'There's not a clear route to ultrasound training. It's quite a convoluted pathway.' – Participant 22

'I think many of the ACP routes at the moment are not well designed for non-nursing staff.' – Participant 33

Due to the lack of guidance when developing their practice, often sonographers are not aware of who or what is stopping their progress extension of practice, and there is limited transparency.

'You don't know who is stopping the progression, it's not very transparent. You don't know where the brick wall is particularly, I mean a lot of it doesn't go past the line manager.' – Participant 7

Accessing training and mentoring opportunities presents a challenge for most wanting to develop their skills and expand their practice. There are various training workshops hosted by the British Medical Ultrasound Society or at industry level, but these still rely on support from departments. With the noted lack of succession planning in many departments,

training and mentoring are sometimes only considered when there is a service need, for example if someone with particular expertise leaves the trust. All participants are aware of the training provided by universities, but this still includes having to identify a clinical mentor and have access to clinical experiences.

'You know of very good sonographers that are itching to do further things and it's just getting the right type of training and then having the right follow up afterwards.' – participant 13

Many participants have had experience of travelling to different hospitals for training, but these are not established partnerships, and usually reliant on the individuals or services identified forging these partnerships. It was acknowledged that the idea of external mentors and training is useful. There were however, challenges with supporting the training of those from outside their own trusts, knowing that they were unable to offer a job at the end of it. To overcome this, a region wide academy or training hub scenario would be useful, and especially if it was to be centrally underpinned by a university course.

'You don't mind investing in your own, but you're so busy you don't really want to start investing in other people and it's a mindset and is very, very difficult to get over.' – Participant 16

There were mixed views on the provision of direct entry undergraduate courses for sonography, although this would be useful for progression of the profession; the lack of registration would still be an issue, and concerns were raised over the suitability and calibre of individuals.

'If you could have an undergraduate BSc course and come straight direct into ultrasound, it'll be great, but you can't because if you don't have registration, you really struggle to get a job in the NHS.' – Participant 21.

However, these pathways are evolving, with several trusts having clear sonography training routes, and departments growing their numbers of sonographers each year. Having clear guidance, protocols, training pathways, competency frameworks and checklists is helpful for both those being trained and those overseeing the training. Participants were also aware of various local and regional networks, where sonographers are able to support each other and share resources. One trust had created a role to oversee all sonographer training, creating a training roster and organising courses and workshops. This role was deemed successful, and funding was allocated to make this a permanent position.

'Somebody's dedicated to looking at all of the training and coordinating it and such, it works really well, and everybody gets what they need. It's been a really valuable role, really valuable.' – Participant 24

Theme 5: Practical constraints: finances, space and isolated working



Alongside the clinical pressures that many are experiencing, practical constraints were highlighted. Particularly the inequalities within sonography and pay. Participants highlighted that pay is not usually a factor discussed while training, resulting in individuals having to push their line manager for this support. Participants often advised that sonographers should be aware that a banding increase may not automatically occur following training, as obtaining approval for submitting business cases is a barrier. There is also disparity between trusts, with one participant relocating and having to reduce their salary despite being able to complete interventional work autonomously. Another participant was only given support to develop and increase their banding once they had threatened to leave their trust. Funding is not only required for increases in banding, but to also support training, both practical and theoretical. Access to funding for particular specialities such as MSK, was described as even more of a challenge.

'So, we tended to develop the staff, they'd be delivering the service and then we'd have the debate around and they need to be paid for it.' – Participant 23

Due to the stipulations of the NHS agenda for change guidance, those working at a band 8 are unable to claim for overtime, so this does not assist with reducing waiting lists and meeting the clinical service requirements. Participants also recognised that this could be the driver for those working additional hours in the private sector.

'The eights [NHS banding] won't do any extra lists. And guess what, they go off and work in the independent sector instead on a Saturday, because they get paid more money.' – Participant 23

Even those who are able to support others in their training described the challenges in doing so. Providing training courses within a clinical department requires investment of staff time to organise the entire process.

'It was a bit mad because I was doing all the admin, all of the lectures and sorting everything out and so they're pretty exhausting.' – Participant 35 (on organising a HyCoSy training course)

Some participants described the practical issues of working in isolation, particularly in smaller hospitals with limited space. The responsibility can be quite challenging, but it also presents an opportunity to overcome obstacles, which is valuable. In some smaller hospitals, the practicalities of not having the physical room to be able to have additional ultrasound rooms is a challenge and limits departments' ability to function effectively.

'There's not the physical space within the building in order to do it, and at the moment there doesn't seem to be much of a solution to that.' – Participant 4

Theme 6: Overcoming the fear of change and paving the way for others

Several participants were the first to enhance their scope of practice within their departments, meaning they were often creating their own scope, designing the provision, and supporting the development of their department's standard operating procedures, protocols and job descriptions.



'I suppose I was having to start from scratch. There were no policies or anything in place with regards to protocols. So, I was I was writing all of those as well.' – Participant 19

This is particularly challenging when sonographers or their line managers have not experienced similar situations before. However informal national forums, such as the head and neck forum, provide access to template resources such as policies, protocols and job descriptions.

'The managers aren't aware of how to even start that process. So, I think that's definitely an invaluable source for policies, protocols, job descriptions.' – Participant 19

Participants highlighted that sometimes it is not the lack of support, but rather the not knowing how to support, particularly when time is always a challenge. One participant was able to visit other trusts to assist with this concern. Others commented that one of the valuable aspects of the workshops had been the opportunity to network with colleagues who had already navigated a way to establish new services.

'It's a little bit hard because no one knows how to support, other than there's no support' – Participant 8

'I think it was just knowing what to do and knowing if we were doing it right, because obviously as I said, I had no role. I had no one before me to compare what we were doing. I visited other trusts and looked at what they offered.' – Participant 27

Many participants had experienced a fear of change from colleagues and departments, and were often met with questions as to why it needed changing if it had not been done before. The fear not only comes from colleagues and departments, but also sonographers themselves who recognise and understand the increased responsibility that comes with expanding their practice and service provision.

'I think the mindset has been the greatest factor to get the changes in place because some people are still uncomfortable with the change, but we've had the debate and we can all agree that it's a bit uncomfortable, but really, we need to try and move in this direction because it's necessary as there is a need.' – Participant 26

Those who have successfully enhanced their scope of practice then have the responsibility to advocate for creating more accessible pathways. Supporting more sonographers to develop their practice will inevitably lead to an increased number of mentors. The importance of succession planning in these roles from an early stage was also an important factor.

'It's important for me and people in roles like mine that that we do succession plan from an early stage.' – Participant 19

Workshops: impact and improvements

The workshops held at UWE in February were well received by all attendees, and beneficial for different experience levels. Described as well organised and enjoyable, participants highlighted confidence and reassurance as an outcome. For those who already had relevant experience in the areas, the workshops provided reassurance that they were performing techniques correctly, plus they learnt alternative techniques and patient positioning guidance. The reassurance that techniques are being performed correctly is not always provided in their service due to the lack of time. The workshop acted as a refresher for areas that are not seen frequently, such as elbow joints for MSK. For those who did not have prior experience, it provided a good overall introduction.



Participants reported a good balance of theory and practical at a good pace. The practical aspects of the workshops were considered key as they allowed participants to practice areas such as needle guidance skills in a safe environment, using simulated phantoms. The presentations regarding setting up a new service and the governance surrounding this was highlighted as useful and inspiring. The expert knowledge and skill level of the facilitators involved was regularly cited by participants.

'I think the workshop was really useful in terms of practising needle guidance skills and playing with different bits of equipment in a safe environment....I think it would have set me up really well for transferring those practical skills into real life situations on human beings' – Participant 10

'Certainly enthused us to really want to push ahead and make this a reality' – Participant 22 (on setting up a paracentesis service)

The workshops also provided an opportunity for the facilitators and attendees to network and discuss their current positioning and their services. For those currently experiencing challenges in trying to expand their scope of practice, it provided assurance that they are not alone. It also gave an opportunity to attendees to have discussions with those who have overcome challenges and have experience of implementing changes, such as creating business plans.

'I know a lot of them are in ongoing battles. But it was good. I think it was good for them to realise they weren't alone.' – Participant 4

'It was really interesting. It was really good to get your hands on practising things. And like I said, they're very inspirational to meet the people that are doing this as part of their roles and their role extension and things like that. Yeah. It was a really fantastic couple of days.' – Participant 13

With regards to impact following the workshops, most participants highlighted that it may be too early to note any significant changes due to constraints such as time, waiting lists, colleagues already involved in training and lack of support from their departments. It was recognised that, although the workshops were useful for knowledge, networking, practical skills and confidence there's a limitation on the impact of a one-day workshop and participants felt follow-up workshops would be valuable for their development. However, some impacts since the workshops have included exploring funding opportunities for additional training, implementing learning such as adapting their positioning when completing scans and arranging observations for MSK injections. Participants had reported

the consideration of setting up additional services, with one participant currently completing scoping exercises to support conversations about an additional service.

'Although you know this is something that the trust wants long term, we're not quite there yet, but it's certainly put some foundations down.' – Participant 4

When asked about suggestions for enhancements to the workshops, limited suggestions were made. Individual observations included more information on aseptic technique, further information on associated medications, increased number of phantoms for practicing, explanation of additional possible techniques, and perhaps more of a balance between superficial and deep structures for biopsies and FNAs. One suggestion also included a collaboration with an Imaging Training Academy in the future.

Departmental managers did provide reasons for non-attendance of their staff, and this was mainly around time and having more notice would have been useful, particularly as there was not enough time to include the workshops into career development plans. A second reason was related to any attendee still requiring support from departments in order to become competent once they had completed the workshop.

'But then when they come back, what do they do after a workshop, you need the consultants to be able to support that. You need the supervision; you need the governance around it because no one is competent after two days.' – Participant 26

Mentor register: its value as a resource



Participants described the mentor register as a helpful resource, particularly as the profession of sonography can be isolating. Having guidance on who to contact for different specialty areas was considered valuable. Several workshop participants had not yet contacted potential mentors due to either it not being the right time as their own departments were not yet supportive, or they already had support in place more locally.

'Unless you have somebody within your trust who's supporting you, it's relatively fruitless. That's what I would say about mentor registers.' – Participant 6

Those who had contacted a mentor from the Register had found the process to be one of the most valuable aspects of their career development.

'I've developed a really strong bond with my mentor and he's so interested in sharing his knowledge and helping me progress. I had so many barriers in my department but now I have a well-known and respected mentor it's given me more credibility to do be able to do this work' – Participant 8

Those in the earlier stages of development didn't feel they were able to ask for mentoring and it was recognised that contacting any potential mentor can be daunting.

'It's probably quite daunting, it's a certain sort of person who's brave enough to go, oh, you know, I quite fancy doing that. I'll just contact this person who's an expert in the field.' – Participant 18

It was acknowledged that ideally, those wishing to expand their scope of practice should have a mentor in their own department. Whilst an external mentor is an alternative, they may not be able to have the same level of impact.

"I would like to think that, if you are taking on an extended role or training to undertake an extended role in your department, then you really should have a mentor within your own department to guide and help your learning' – Participant 32

Discussion

The thematic analysis of the transcribed interviews resulted in the development of six key themes outlined above. Discussions centred around challenges for sonographers and department, plus opportunities for a positive way forward (Figure 3). Some of the issues identified within the interviews are discussed in this section.

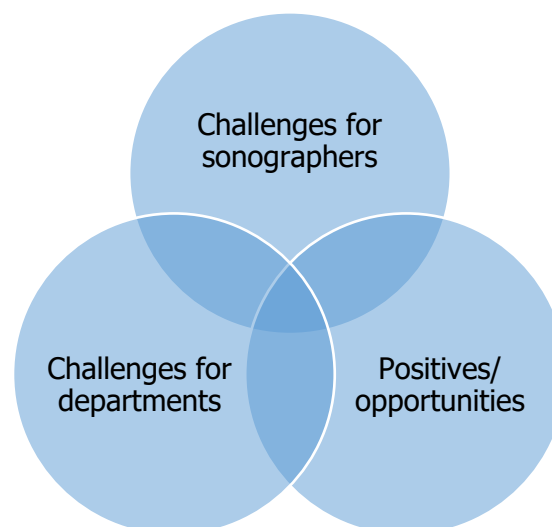


Figure 3. Discussions

Participant comments

Many of the comments made by participants demonstrated a lack of awareness of strategic developments in the SW region relating to sonography training and practice. In addition, whilst this study was undertaken between February and April 2024, there have been several subsequent NHSE developments in sonography training and practice. The South West Imaging and Training Academy (SWITA) for example, has recruited new experienced sonographers to develop sonography training in this area. Specific sonography training workshops are being developed as a result of this. In addition, a review of the sonographer training pipeline has been undertaken, identifying requirements needed to meet future service needs.

There is ongoing work in the SW to develop communication channels to better share the ongoing changes and strategic developments. One example encompasses representatives from all departments in the region. The purpose of this initiative is to look at sonography roles and training opportunities, in order to ensure appropriate people are able to contribute their views and suggestions, and to receive updates on sonographic development and opportunities in the region. There is an intention to work collaboratively to support training and development of sonographers across the region with the support of imaging networks and SWITA.

Staff shortages

The problems with staff shortages in many departments were a significant barrier in most departments to sonographers being able to extend their skills and the services offered. The shortages resulted in a requirement for sonographers to be limited to focus on routine patient scanning lists, rather than spending time learning new skills. Even when sonographers did have additional practice skills, they were often denied opportunities to use these skills due to the requirement to focus on routine work. Examples were given by interview participants of resigning to take on roles in the private sector where training opportunities were more widely available. Some were aware of colleagues who moved into higher paid roles as agency or locum radiographers, as a result of frustrations experienced in the workplace. This will inevitably have an impact on the NHS Long Term Workforce Plan (NHS E, June 2023).

Managers identified that the focus in the NHS is on reducing waiting lists, with penalties incurred if there are breaches. This leads them to take a short-term approach to the problem, focusing on routine day-to-day work, rather than being encouraged to take a more strategic long-term approach. If they were enabled to look for longer-term solutions, a more effective programme of training the workforce for the future would be encouraged.

If the NHS is to continue to be a health service which provides high quality care for patients, it needs to address staff frustrations by producing a robust and effective plan to ensure we have the right number of people, with the right skills and support in place to be able to

address long patient waiting lists for diagnostic procedures. The strategic work currently underway in the SW by NHS E is designed to help address this challenge.

Professional dominance and protectionism

Sonographers often encounter obstacles to their ambitions to ~~extend~~ expand their skills ~~practice~~, and experiences of medical dominance of sonographers working in healthcare seem to be a concern in some areas. In common with other healthcare professionals, some have found ways to navigate or negotiate around it (Luetsch *et al*, 2019).

Perceived and actual dominance in interprofessional interactions with doctors are stressors which may affect sonographers' ability to progress within their careers, to problem-solve, or their general role effectiveness and satisfaction.

There is some historical context for the way in which the nursing and Allied Health Professions have been dominated by the medical profession. Since the late 1980s there has been a strong move by the Government to reduce the medical dominance and power of doctors in the clinical environment. This had a significant impact on nurses who received encouragement and incentives to move into management hierarchy away from patriarchal medical dominance (Collinson, 2002). This process, however, did not extend to Allied Health Professionals (AHPs) and, as a result, these professional areas became subsumed under nursing colleagues who were recruited to board level leadership roles (Wenger, 1998). Currently statute requires foundation trusts to have both a medical director and a director of nursing. As a result, very few AHPs have ever achieved board level roles. This is a far-reaching issue across health services. The lack of access to Board level roles inevitably affects AHP's access to decision makers and access to funding for e.g. training, or to effect change within healthcare systems.

The voice of AHPs in the healthcare setting

AHPs have generally not been able to find a way to act as one body, which would inevitably strengthen their voice in the healthcare workplace. Instead, they are a group of rather disparate professions, and have apparent differences amongst themselves. It is often difficult to have one voice or avoid competing with each other in terms of skills and capabilities of staff. The professional bodies often appear to encourage this 'protectionist' approach. AHPs are currently a group of 15 very different professions with often little in common. The only feature that links them generally seems to be perceived as the fact that they are not nurses or doctors. Generally, people understand what nurses and doctors are, but they have less confidence knowing what the other smaller professions might do, or what skills they possess. As a result, decision-makers may focus on nursing when making strategic decisions or prioritising funding for role development.

The role of professional bodies is often seen as an obstruction for uniting AHPs. They tend to understandably, be protectionists for their own individual body of professionals and

perhaps need to look at focusing differently on how to enhance opportunities for AHPs in general, in order to drive the extending practice agenda forward. It was acknowledged that the professional bodies actively encourage the individual profession focus, as this is part of their remit. However, they perhaps have a role here to promote AHPs rather than their profession specific focus, which could risk diluting the overall identity of AHPs. It was recognised that grouping together of the professions provided a stronger voice and an increased profile. This was seen as a positive enabler to create more connections with senior decision makers. However, the complexities associated with the different professions means that AHP's often cannot agree as a group at the core dimension. In order to truly speak as one voice, we need first to learn how to join up the 15 professions.

As a result, AHPs are often reluctant to challenge the dominance of the larger professional bodies (such as RCR or GMC) preferring to avoid any overt confrontation which may be perceived as a battle too difficult to win.

A paucity of research was noted relating to AHP career progression and development. NHS Improvement (NHS I) has published a number of useful documents offering guidance for AHPs working in clinical practice (NHS I, 2019). HEE has produced a resource '*Supporting the development of the AHP workforce and AHP careers*' (HEE, 2019) which provides guidance on a number of career pathways open to AHPs. However, these documents primarily focus on increasing leadership roles in clinical settings rather than extending clinical roles.

As previously noted, sonography is not recognised as a profession by any regulatory body (such as the Health & Care Professions Council [HCPC]). As a consequence, there are many sonographers working in the field (such as vascular technicians) who are not AHPs, nurses or doctors, and therefore not registered. As well as an absence of protection for the public, this results in them having an even smaller voice than AHPs in the healthcare workplace.

Access to development opportunities by AHPs

AHPs are the third largest workforce in the NHS. Collectively, there are over 170,000 AHPs working in the NHS (NHS I, 2019). They practise in most clinical pathways and work across organisational boundaries at all stages of the pathway. NHS Improvement, in their document '*Leadership of allied health professions in trusts: what exists and what matters*' NHS I (2018) acknowledged that 'There has never before been such a need to harness their potential for transforming healthcare'. However, their contributions to outcomes are often poorly understood, resulting in missed opportunities for their collective potential to support the transformation of health and care. The NHS Long term Workforce Plan (June 2023) states that the NHS workforce needs to think about working and training differently in order to increase productivity

The Chief Allied Health Professions Officer in England published the results of a large national research project *AHPs into Action: Using AHPs to transform health, care and*

wellbeing (NHS E, 2017). This has had an impact on inspiring AHPs and clinical managers to think differently about how clinical services are offered; it has succeeded in raising the profile of AHPs and provided the various professions with the confidence to shape new models of care. Simon Stevens, Chief Executive, NHS England, acknowledged the potential of AHPs in the clinical environment when he stated that 'We must unleash the energy, insight and brilliance of AHPs' (NHSI, 2019).

With growing numbers of AHPs in leadership positions in NHS E, this has raised the profile and created more awareness of AHP professionals generally. However, there is potential for greater extension of roles for AHPs.

Mentorship

The importance of mentorship within healthcare training is well recognised (Burgess *et al*, 2018). It offers a way to further enhance workforce performance and engagement, promote learning opportunities, and encourages multidisciplinary collaboration. There are both career and life benefits associated with mentorship, and it is increasingly recognised as a two-way process that benefits both mentors and mentees. Recently, mentoring has been considered an essential step in professional and personal development, particularly in the field of healthcare (Henry-Noel *et al*, 2019). Mentoring skills are valuable assets for healthcare professionals, who can influence and help shape the careers of the next generation of healthcare providers. The practice of mentorship involves both a coaching and an educational element. A degree of altruism is essential in any mentor due to the requirement for a generosity of time, empathy, plus a willingness to share knowledge and skills (Hill & Wheat, 2017). In addition, an enthusiasm for teaching and the success of others, is essential, and contrasts with the protectionism that can exist in some professionals. Being mentored effectively can have an important influence on personal development, and career direction

Confidence

Issues around lack of confidence appeared evident during this project and, although this was not explicitly articulated by workshop participants and their managers, it was raised by mentors *i.e.* those sonographers who had managed to break through the barriers to obtain appropriate training to extend their practice. They identified that sonographers need to have the confidence to challenge existing models of healthcare working and create a space for themselves to take on new roles and responsibilities. In addition, they needed the self-belief that they were capable of taking on enhanced scope of practice roles, and to harness the inner confidence needed to push for this. Undoubtedly, this would help them to overcome the hurdles they would inevitably encounter on their journey (Dimas *et al*, 2018).

As part of confidence, a willingness to 'step out of their comfort zone' was a trait identified by mentors who had been through this process themselves, in order for sonographers to get access to training and set up new services. Without the confidence to do this, progression and advancement would not take place

Resilience

Resilience was described by several sonographers to be one of the reasons why they had managed to achieve their goal. Resilience can be described as the process of adapting and recovering well from adversity, trauma, tragedy or threats (Webb, 2013). It could also be described as the ability to bend instead of breaking when experiencing pressure, or the ability to persevere and adapt when faced with challenges (Dimas *et al*, 2018; NHS Professionals, 2020)

Examples were provided during this research of a number of sonographers who had been obstructed at various levels within hospitals, and in some cases for a number of years. But their perseverance finally led to successful outcomes for sonographers and department services.

Role models for sonographers

Many examples were provided during interviews with mentors, where sonographer extended enhanced scope of practice is being undertaken successfully in departments. These have generally been areas where sonographers have located a mentor for appropriate training, and been supported to set up new services. Appropriate processes have been followed and governance procedures established. These individuals have the potential to become inspiring role models for other sonographers to follow.

This is in contrast to some hospital departments which appear unwilling to challenge existing practices and explore more innovative working methods, by enabling sonographers to take on interventional work. This has become apparent during this study, and a wider evidence base is required to demonstrate real-life successful role model examples.

Requirement for facilities for specific practice training

With the dire shortage of sonographers, and their potential to expand their roles more widely into areas currently being performed by radiologists, there is a requirement for specific practical training facilities for sonographers. SWITA was originally set up by radiologists as a response to the shortage of radiologists, and the perception of participants appears to be an absence of opportunities for sonographers and radiographers to extend their training. A suggestion was made that an Imaging Academy for radiographers/sonographers is an area of need. However, there is currently much work being undertaken by SWITA to address this area, which is intended to address this need and provide a space for these professionals to gain practical skills in a simulated workplace setting.

This could be extended to providing opportunities for training in image interpretation and interventional procedures for other professions such as nurses, physiotherapists, podiatrists

and paramedics. These professions are moving into this space, but facing similar challenges to sonographers, where they struggle to get training to extend their skills in the workplace, due to lack of individuals with the time or inclination to train them.

AHPs and nurses who have been provided with training opportunities to extend their skills have demonstrated their proficiency and effectiveness when undertaking these procedures. In addition, cost savings have resulted where nurses and AHPs have taken on the roles and duties previously carried out by more highly reimbursed / expensive radiologists. In addition, this will help to free up radiologists to perform more complex procedures

Key recommendations

- Work with sonographers who have successfully managed to break through barriers to expand their practice, and use them as role-models or advocates for enabling development of others. Develop case histories of these individuals to inspire and signpost the way for others. By harnessing the inherent skills and characteristics of these individuals, it may be possible to include this in a development programme for others.
- Extend the Mentor Register to enable it to be shared more widely across the UK, in order to extend its impact.
- Establish a mentor / coaching training scheme for healthcare workers to increase the awareness of the importance of this role to encourage uptake of this opportunity.
- Develop an immersive simulation learning model which could be used to host interactive workshops to include a sharing of sonographic interventional skills, experience and knowledge nationally or internationally e.g. Igloo Immersive Learning Environment White Paper.pdf (igloovision.com).
- Continue to provide more opportunities for sonographers to gain practical skills in a simulated workplace setting to enable them to obtain new skills.-This could potentially be opened more widely to AHPs and nurses, to provide them with training opportunities for areas such as interventional skills and image interpretation. Nurses, physiotherapists, podiatrists and paramedics are professions which also encounter challenges to extend their training in image interpretation. Whilst a number have moved into this space, progress is limited as these professions are facing the same challenges as sonographers, where they struggle to get training to extend their skills in the workplace.
- Continue to provide guidance for sonographers and their managers on how to successfully navigate bureaucratic NHS Trust processes to ensure appropriate governance and indemnity cover is in place for sonographers to enhance their roles.
- Continue to encourage radiology / sonography managers to take a more strategic approach to developing their workforce rather than focussing on short-term methods to fill gaps.

Conclusion

Conversations with sonographers, plus their mentors and managers, provided opportunities to obtain valuable insights from those who had experienced challenges when trying to expand their range of skills and the services offered within departments. Discussions were wide-ranging, but findings focused around six distinct themes.

These findings help to provide an insight into potential reasons why sonographers are not always able to expand their skills, and why sonography departments often have long patient waiting lists. A number of recommendations have been made to ensure that sonographers and their departments are provided with the support mechanisms, and the opportunities for them to be able to move into expanding their services and developing their roles in the future.

The findings from this study will be used to apply for a subsequent grant application for a future project to design developmental opportunities for individuals, to support them to reach enhanced positions in order to realise their full potential.

The researchers would like to thank the funders NHS E for their support during the completion of this research.

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Appendices

Appendix 1: Participant information sheet: workshop attendees

Research study: Development of Sonography Practice to Accelerate Patient Care

Participant Information Sheet

You are invited to take part in research taking place at the University of the West of England (UWE), Bristol, which has been funded by NHS England (NHSE). Before you decide whether to take part, it is important for you to understand why the study is being done and what it will involve. Please read the following information carefully and if you have any queries or would like more information, please contact the research team using the contact details displayed at the end of this participant information sheet (PIS).

Aims of the research

Within the UK patient waiting lists for sonography examinations are continuing to increase, particularly since the COVID-19 pandemic. Clinical sonographers are in a favourable position to expand their scope of practice and introduce new and innovative approaches to imaging and reporting, which could alleviate lengthy patient waiting lists. To facilitate this, sonographers will need supplementary training to acquire appropriate skills and knowledge. UWE are organising several workshops facilitated by advanced practitioners. Following the workshops, attendees will be paired with a clinical expert mentor.

The aims of this research are:

- To understand the current position of sonographers and departments who want to extend their practice to accelerate patient care.
- To understand the potential barriers, challenges and opportunities that exist for sonographers and their departments who would like to extend their practice and be able to offer additional diagnostic/therapeutic services.
- To explore with the participant the outcome of their training, and whether new services are being offered by them as a result.

What would taking part involve?

If you choose to participate, you will be invited to take part in two interviews. The first will be before you attend the workshop, and the second will be three months after completion.

The interviews will be either online (Microsoft Teams) or by telephone at a time convenient to you. On both occasions, the interviews will last approximately 20 minutes and will be audio-recorded so the interviewer can concentrate on listening to you, and have a record of what you said, so that nothing is missed. During the interview, the researcher will ask you a series of open-ended questions relating to the research.

Why have I been asked to take part?

You have been invited to take part in this research because you have registered to participate in the training and mentorship programme to upskill sonographers.

Do I have to take part?

No. Your participation is entirely voluntary. If you do decide to take part in the research you will still be able to withdraw at any time, including during the interview. If you withdraw from the study, we will keep the information about you that we have already obtained. Withdrawing will not impact your participation in the training and mentorship programme. If you wish to withdraw, please contact the research team using the contact details below.

What are the benefits and risks of taking part?

If you decide to take part, you will help us to understand the enablers, challenges and opportunities that exist for sonographers who wish to extend their practice. It will also help to clarify the current position of sonographers and their departments, and how they can be enabled to address patient waiting times. You will also help us to identify the outcomes of the programme and any opportunities for future training, which we hope will contribute to accelerated patient care.

While we don't foresee any potential risks associated with your participation in the interview, you are able to ask for the interview to be paused or you can withdraw from the study at any point.

What information will we collect?

We will need to use information from you for this study and monitoring purposes. This information will include:

- Your contact details (to arrange the interview)
- Your job title(s)
- Your current sonography skills

- The sonography skills you hope to develop
- Job setting
- Years of experiences
- Gender
- Ethnicity/race
- Age

Is the information I provide confidential?

We are interested in creating a general understanding of participants' experiences. All notes, documents, audio-recordings and information about the interview will be kept confidential and only members of the research team will have access to the data. Your personally identifiable information will be stored separately. You will not be personally identifiable from any reports or outputs from the research. Quotations may be used as examples but will not be attributable to individuals.

Hard-copy data will be stored at the University of the West of England in a fireproof, lockable filing cabinet. Hard copies of identifiable information will be destroyed when no longer required by the research team. All electronic participant data will be stored in a secure UWE OneDrive folder. Participant contact information will only be stored as long as is necessary. All interviews will be recorded on an encrypted Dictaphone or Microsoft Teams. Data recorded on a Dictaphone will be transferred to a computer at the researcher's earliest convenience. All data will be destroyed within five years of study end.

Please see the attached UWE Privacy Notice for Research Participants (V2.0, November 2020) for further information about how UWE collects, manages and uses your personal data.

What will happen to the findings from the project?

The initial findings will be presented in the form of a report to the sponsors NHSE. Findings may also be published in a peer-reviewed journal to share the results more widely, and used to help shape future mentorship and development opportunities for sonographers.

Can I agree to the interview, but refuse to be recorded?

Yes, written notes will be taken during the interview.

Who has reviewed the project?

This project has been approved by the UWE Research Ethics Committee on 5th January 2024 (reference number: CHSS.23.11.060). comments, questions or complaints about the ethical conduct of this study can be addressed to the Research Ethics Committee at UWE (Researchethics@uwe.ac.uk).

What if something goes wrong?

This is a very low risk study. However, if you feel distressed as a result of taking part, please contact the Chief Investigator, Dr Vivien Gibbs, using the contact details below. Please see above for contact details in the event of complaints or queries.

What should I do next?

Thank you for considering taking part in this important study. If you would like to take part, have any questions, or do not understand anything, please contact the research team using the contact details below.

<p>Dr Vivien Gibbs, Chief Investigator Tel: 0117 3288412 Email: Vivien.gibbs@uwe.ac.uk Jessica Coggins, Research Associate</p>

Research study: Development of Sonography Practice to Accelerate Patient Care

Participant Information Sheet

Mentors and department managers

You are invited to take part in research taking place at the University of the West of England (UWE), Bristol, which has been funded by NHS England (NHSE). Before you decide whether to take part, it is important for you to understand why the study is being done and what it will involve. Please read the following information carefully and if you have any queries or would like more information, please contact the research team using the contact details displayed at the end of this participant information sheet (PIS).

Aims of the research

Within the UK patient waiting lists for sonography examinations are continuing to increase, particularly since the COVID-19 pandemic. Clinical sonographers are in a favourable position to expand their scope of practice and introduce new and innovative approaches to imaging and reporting, which could alleviate lengthy patient waiting lists. To facilitate this, sonographers will need supplementary training to acquire appropriate skills and knowledge. UWE organised several workshops facilitated by advanced practitioners. Following the workshops, have been paired with a clinical expert mentor.

The aims of this research are:

- To understand the current position of sonographers and departments who want to extend their practice to accelerate patient care.
- To understand the potential barriers, challenges and opportunities that exist for sonographers and their departments who would like to extend their practice and be able to offer additional diagnostic/therapeutic services.
- To explore the outcome of their training, and whether new services are being offered by them as a result.

What would taking part involve?

If you choose to participate, you will be invited to take part in an interview. The interviews will be either online (Microsoft Teams) or by telephone at a time convenient to you. The interviews will last approximately 20 minutes and will be audio-recorded so the interviewer can concentrate on listening to you, and have a record of what you said, so that nothing is

missed. During the interview, the researcher will ask you a series of open-ended questions relating to the research.

Why have I been asked to take part?

You have been invited to take part in this research because you have a sonographer who is working in your department, and / or you are mentoring a student who has registered to participate in the UWE sonography training programme to upskill sonographers.

Do I have to take part?

No. Your participation is entirely voluntary. If you do decide to take part in the research you will still be able to withdraw at any time, including during the interview. If you withdraw from the study, we will keep the information about you that we have already obtained. Withdrawing will not impact your participation in the training and mentorship programme. If you wish to withdraw, please contact the research team using the contact details below.

What are the benefits and risks of taking part?

If you decide to take part, you will help us to understand the enablers, challenges and opportunities that exist for sonographers who wish to extend their practice. It will also help to clarify the current position of sonographers and their departments, and how they can be enabled to address patient waiting times. You will also help us to identify the outcomes of the programme and any opportunities for future training, which we hope will contribute to accelerated patient care.

While we don't foresee any potential risks associated with your participation in the interview, you are able to ask for the interview to be paused or you can withdraw from the study at any point.

What information will we collect?

We will need to use information from you for this study and monitoring purposes. This information will include:

- Your contact details (to arrange the interview)
- Your job title(s)
- The sonography skills you hope to support your colleague/mentee to develop
- Job setting
- Years of experiences

- Gender
- Ethnicity/race
- Age

Is the information I provide confidential?

We are interested in creating a general understanding of participants' experiences, the skills they have developed from this programme and whether new services have been set up in departments as a result of their training. All notes, documents, audio-recordings and information about the interview will be kept confidential and only members of the research team will have access to the data. Your personally identifiable information will be stored separately. You will not be personally identifiable from any reports or outputs from the research. Quotations may be used as examples but will not be attributable to individuals.

Hard-copy data will be stored at the University of the West of England in a fireproof, lockable filing cabinet. Hard copies of identifiable information will be destroyed when no longer required by the research team. All electronic participant data will be stored in a secure UWE OneDrive folder. Participant contact information will only be stored as long as is necessary. All interviews will be recorded on an encrypted Dictaphone or Microsoft Teams. Data recorded on a Dictaphone will be transferred to a computer at the researcher's earliest convenience. All data will be destroyed within five years of study end.

Please see the attached UWE Privacy Notice for Research Participants (V2.0, November 2020) for further information about how UWE collects, manages and uses your personal data.

What will happen to the findings from the project?

The initial findings will be presented in the form of a report to the sponsors NHSE. Findings may also be published in a peer-reviewed journal to share the results more widely and used to help shape future mentorship and development opportunities for sonographers.

Can I agree to the interview, but refuse to be recorded?

Yes, written notes will be taken during the interview.

Who has reviewed the project?

This project has been approved by the UWE Research Ethics Committee on 5th January 2024 (reference number: CHSS.23.11.060). comments, questions or complaints about the ethical

conduct of this study can be addressed to the Research Ethics Committee at UWE (Researchethics@uwe.ac.uk).

What if something goes wrong?

This is a very low risk study. However, if you feel distressed as a result of taking part, please contact the Chief Investigator, Dr Vivien Gibbs, using the contact details below. Please see above for contact details in the event of complaints or queries.

What should I do next?

Thank you for considering taking part in this important study. If you would like to take part, have any questions, or do not understand anything, please contact the research team using the contact details below.

Dr Vivien Gibbs, Chief Investigator

Tel: 0117 3288412

Email: Vivien.gibbs@uwe.ac.uk

Jessica Coggins, Research Associate

Tel: 0117 32 88427

Email: Jessica.Coggins@uwe.ac.uk

Appendix 3: Privacy Notice

Privacy Notice for Research Participants – Development of Sonography Practice to Accelerate Patient Care

Purpose of the Privacy Notice

This privacy notice explains how the University of the West of England, Bristol (UWE Bristol) collects, manages and uses your personal data before, during and after you participate in development of sonography extended practice to accelerate patient care. 'Personal data' means any information relating to an identified or identifiable natural person (the data subject).

This privacy notice adheres to the General Data Protection Regulation (GDPR) principle of transparency. This means it gives information about:

- How and why your data will be used for the research;
- What your rights are under GDPR; and
- How to contact UWE Bristol and the project lead in relation to questions, concerns or exercising your rights regarding the use of your personal data.

This Privacy Notice should be read in conjunction with the Participant Information Sheet and Ethical Consent Form provided to you before you agree to take part in the research.

Why are we processing your personal data?

UWE Bristol undertakes research under its public function to provide research for the benefit of society. As a data controller we are committed to protecting the privacy and security of your personal data in accordance with the (EU) 2016/679 the General Data Protection Regulation (GDPR), the Data Protection Act 2018 (or any successor legislation) and any other legislation directly relating to privacy laws that apply (together "the Data Protection Legislation"). General information on Data Protection law is available from the Information Commissioner's Office (<https://ico.org.uk/>).

How do we use your personal data?

We will only process your personal data when the law allows us to. In addition, we will always comply with UWE Bristol's policies and procedures in processing your personal data. Our lawful basis for using your personal data for research purposes is fulfilling tasks in the public interest, and for archiving purposes in the public interest, for scientific or historical research purposes.

You can find out more information about lawful bases at the following webpage:

<https://ico.org.uk/for-organisations/guide-to-data-protection/guide-to-the-general-data-protection-regulation-gdpr/lawful-basis-for-processing/>

We will always tell you about the information we wish to collect from you and how we will use it. We will not use your personal data for automated decision making about you or for profiling purposes.

Our research is governed by robust policies and procedures and, where human participants are involved, is subject to ethical approval from either UWE Bristol's Faculty or University Research Ethics Committees. This research has been approved by UWE research ethics committee (reference number CHSS.23.11.060). For any ethics comments, questions or complaints, please contact researchethics@uwe.ac.uk.

The research team adhere to the principles of the General Data Protection Regulation (GDPR).

For more information about UWE Bristol's research ethics approval process please see our Research Ethics webpages at www1.uwe.ac.uk/research/researchethics

What data do we collect?

The data we collect will vary from project to project. Researchers will only collect data that is essential for their project. The specific categories of personal data processed are described in the Participant Information Sheet provided to you with this Privacy Notice.

Who do we share your data with?

We will only share your personal data in accordance with the attached Participant Information Sheet.

How do we keep your data secure?

We take a robust approach to protecting your information with secure electronic and physical storage areas for research data with controlled access. Access to your personal data is strictly controlled on a need to know basis and data is stored and transmitted securely using methods such as encryption and access controls for physical records where appropriate.

Alongside these technical measures there are comprehensive and effective policies and processes in place to ensure that those who process your personal information (such as researchers, relevant University administrators and/or third-party processors) are aware of their obligations and responsibilities for the data they have access to.

By default, people are only granted access to the information they require to perform their duties. Mandatory data protection and information security training is provided to staff and expert advice available if needed.

How long do we keep your data for?

Your personal data will only be retained for as long as is necessary to fulfil the cited purpose of the research. The length of time we keep your personal data will depend on several factors including the significance of the data, funder requirements, and the nature of the study. Specific details are provided in the attached Participant Information Sheet.

Anonymised data that falls outside the scope of data protection legislation as it contains no identifying or identifiable information may be stored in UWE Bristol's research data archive or another carefully selected appropriate data archive.

Your Rights and how to exercise them

Under the Data Protection legislation, you have the following **qualified** rights:

- (1) The right to access your personal data held by or on behalf of the University;
- (2) The right to rectification if the information is inaccurate or incomplete;
- (3) The right to restrict processing and/or erasure of your personal data;
- (4) The right to data portability;
- (5) The right to object to processing;
- (6) The right to object to automated decision making and profiling;
- (7) The right to [complain](#) to the Information Commissioner's Office (ICO).

We will always respond to concerns or queries you may have. If you wish to exercise your rights or have any other general data protection queries, please contact UWE Bristol's Data Protection Officer (dataprotection@uwe.ac.uk).

If you have any complaints or queries relating to the research in which you are taking part please contact either the research project lead, whose details are in the attached Participant Information Sheet or UWE Bristol's research governance manager (researchgovernance@uwe.ac.uk).

v.2: This template Privacy Notice was last amended in November 2020 and will be subject to regular review/update.

Appendix 4: Consent form

Development of Sonography Practice to Accelerate Patient Care

Consent Form

Version 1.0

1st February 2024

Name of Chief Investigator: Dr Vivien Gibbs

Please ensure that you have read and understood the information contained in the Participant Information Sheet (V1.0 dated 1st February 2024) and asked any questions before you sign this form. If you have any questions please contact a member of the research team, whose details are set out on the Participant Information Sheet.

If you would like to continue, please select the next page button below.

1. I confirm that I have read and understood the information in the Participant Information Sheet dated 1st February 2024, which I have been given to read before asked to sign this form. I have had the opportunity to consider the information, ask questions about the study and have had my questions answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any point without giving any reason, without my role or legal rights being affected.
3. I give permission for my interviews to be audio recorded and for the quotes that I provide to be used in future publications. I understand quotes will be anonymised and I will not be able to be identified in any way.
4. I agree that information collected about me as part of the study can be stored and analysed by the research team at the University of the West of England, Bristol.
5. I agree to take part in this research.
6. Please type your full name.
7. Please enter today's date.

Message if consent is not provided: As you have clicked no to this question, you have not provided your consent. Thank you for taking the time to consider taking part in this study.

End message: Thank you for completing this consent form. A member of the research team will be in contact shortly to arrange an interview.

This consent form has been inputted into Qualtrics and the preview can be [found here](#).

Appendix 5: Draft email to participants

Mentors

Dear (insert name)

Thank you for volunteering to be placed on the sonography upskilling register and for volunteering to be a mentor. Alongside this workshop we are aiming to complete a piece of research to understand the current position of sonographers and departments, potential barriers, challenges and opportunities and to explore any outcomes arising from the training. Your involvement will include a short interview at a time convenient for you. Please find attached the participant information sheet and privacy notice which provides further information. We would very much appreciate your participation. If you are happy to participate, please contact Jessica Coggins (Jessica.Coggins@uwe.ac.uk), who can then send you a consent form for completion.

If you have any questions, please do not hesitate to contact us.

Best wishes,

Department managers (via workshop attendees)

Dear (insert name),

Many thanks for attending the sonography upskilling workshop on Thursday 1st/Friday 2nd February 2024 (delete as appropriate). As you know, we are currently completing a piece of research to understand the current position of sonographers and departments, potential barriers, challenges and opportunities and to explore any outcomes arising from the training. We have spoken to a sample of sonographers who attended the workshops, but we would also like to speak to departmental managers to gain their perspective.

Their involvement would include one interview at a time convenient for them, we're not expecting this to last any longer than 20 minutes. This could be by telephone or Microsoft Teams depending on their preference.

We'd be very grateful if you could forward to the attached participant information sheet and privacy notice to your department manager. If they would like to find out more or volunteer to participate, they can contact us via email; Vivien.gibbs@uwe.ac.uk or Jessica.Coggins@uwe.ac.uk.

Best wishes,

Department managers – direct email

Dear department manager (insert name),

As you may be aware, we provided two workshops in early February to support the upskilling of sonographers. Alongside this work, we are currently completing a piece of research to understand the current position of sonographers and departments, potential barriers, challenges and opportunities and to explore any outcomes arising from the training. We have spoken to a sample of sonographers who attended the workshops, but we would also like to speak to departmental managers to gain their perspective.

Your involvement would include one interview at a time convenient for you, we're not expecting this to last any longer than 20 minutes. This could be by telephone or Microsoft Teams depending on your preference. Please find attached the participant information sheet and privacy notice which provides further information.

We would very much appreciate your participation. If you are happy to participate, please contact Jessica Coggins (Jessica.Coggins@uwe.ac.uk), who can then send you a consent form for completion.

If you have any questions, please do not hesitate to contact us.

Best wishes,

Research Project: Development of Sonography Practice to Accelerate Patient Care

Topic guide 1 (beginning of training)

Version 2.0 19th December 2023

Thank you for agreeing to take part in this study. We are conducting interviews with sonographers to understand yours and your department's current position and potential barriers, challenges and opportunities that exist for those who would like to extend their practice and be able to offer additional diagnostic/therapeutic services.

I'll be asking you open-ended questions. There are no right answers; you are the expert about your thoughts and experiences, and I'm here to learn from what you have to say. Where you feel it is appropriate, please give lots of detail.

The interview will last approximately 20 minutes, but this is dependent on how much you would like to say, and you are free to leave the interview at any time. The interview will be recorded, and I will let you know before I start recording. The recording will be transcribed and will be anonymised. The recording will not be played to anyone else, except the transcriber. The recording will be destroyed once the transcript has been checked for any errors.

Do you have any questions before we begin?

START RECORDING

Please could I ask you to confirm that you have read the information sheet and signed a consent form, and that you know that this interview will be recorded and are still happy to take part in this study?

- What is your professional background and how long have you been qualified in your specific profession?
- How long have you been working as a sonographer?
- How have you been supported in your development as a sonographer?
- Who or what was the driving force for you to extend your sonography practice?
Prompts: you, your line manager, a radiologist or other?
- What are the challenges that you or your department have faced when trying to extend the practice of sonographers in your place of work?
- Are you aware of any sufficient training or mentorship opportunities for sonographers wishing to extend their practice?

Prompt: Locally or more widely. If not, what could be done to enhance this?

- Any other comments, thoughts, or observations?

Appendix 7: Interview guide questions – workshop attendees 2

Research Project: Development of Sonography Practice to Accelerate Patient Care

Topic guide 2 (3 months after the training)

Version 1.0 20th November 2023

Thank you for agreeing to take part in this study. We are conducting interviews with sonographers to understand yours and your department's current position and potential barriers, challenges and opportunities that exist for those would like to extend their practice and be able to offer additional diagnostic/therapeutic services.

I'll be asking you open-ended questions. There are no right answers; you are the expert about your thoughts and experiences, and I'm here to learn from what you have to say.

Where you feel it is appropriate, please give lots of detail.

The interview will last approximately 20 minutes, but this is dependent on how much you would like to say, and you are free to leave the interview at any time. The interview will be audio recorded, and I will let you know before I start recording. The recording will be transcribed and will be anonymised. The recording will not be played to anyone else, except the transcriber. The recording will be destroyed once the transcript has been checked for any errors.

Do you have any questions before we begin?

START RECORDING

Please could I ask you to confirm that you have read the information sheet and signed a consent form, and that you know that this interview will be recorded and are still happy to take part in this study?

- Please could I ask for your professional background and your current role?
- How did you find the training and mentorship process your participating sonographer experienced? What is your opinion of the quality of their experience?
- How could it have been enhanced?
- Has the process resulted in your participating sonographer and/or your department offering additional services for patients?
(Prompt; If not why is this?)

- What challenges have you faced in supporting your sonographer to extend their sonography practice? (Both before they attended the workshop and/or since)
- What challenges generally have you faced in offering additional services in your department?
- To support our analysis and reporting, I have a few demographic questions. Please do let me know if you would rather not answer. Please could I ask for your age?
- What is your gender identity?
- What is your race/ethnicity?
- Any other comments, thoughts, or observations?

Appendix 8: Interview guide questions – managers and mentors

Research Project: Development of Sonography Practice to Accelerate Patient Care

Topic guide 3 (managers and mentors)

Version 1st February 2024

Thank you for agreeing to take part in this study. We are conducting interviews with mentors and managers of sonographers who have attended the UWE workshops. This is to understand your sonographer's and/or your department's current position, and the potential barriers, challenges and opportunities that exist for those who would like to extend their practice and be able to offer additional diagnostic/therapeutic services.

I'll be asking you open-ended questions. There are no right answers; you are the expert about your thoughts and experiences, and I'm here to learn from what you have to say. Where you feel it is appropriate, please give lots of detail.

The interview will last approximately 20 minutes, but this is dependent on how much you would like to say, and you are free to leave the interview at any time. The interview will be recorded, and I will let you know before I start recording. The recording will be transcribed and will be anonymised. The recording will not be played to anyone else, except the transcriber. The recording will be destroyed once the transcript has been checked for any errors.

Do you have any questions before we begin?

START RECORDING

Please could I ask you to confirm that you have read the information sheet and signed a consent form, and that you know that this interview will be recorded and are still happy to take part in this study?

- How did you find the training and mentorship process your participating sonographer experienced?
- How could it have been enhanced?
- Has the process resulted in your participating sonographer and/or your department offering additional services for patients?
(Prompt; If not why is this?)
- What challenges have you faced in supporting your sonographer to extend their sonography practice? (Both before they attended the workshop and/or since)
- What challenges generally have you faced in offering additional services in your department?
- Any other comments, thoughts, or observations?