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A Comparative Look at Advanced and Enhanced Clinical Radiography Practices in the UK and Denmark

– a discussion paper

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Abstract

Radiography practice has evolved significantly in both the United Kingdom (UK) and Denmark during the last decade, driven by the need for greater clinical skills and improved patient care. Technological progress has resulted from both innovations in imaging modalities and the expansion of radiographers' responsibilities such as the MRI with more advanced fields, going from film to digital imaging and the latest artificial intelligence (AI) revolution.

By comparing the frameworks, educational pathways, and professional roles associated with enhanced and advanced practice in radiography in these two countries, we provide an overview of options for radiographers to pursue career options. By examining the similarities and differences, we aim to provide insights into how each country approaches the development and implementation of advanced and enhanced radiographic practices.

Introduction

In recent years, radiography has seen significant advancements in practice all over Europe, driven by technological advancements and innovations in imaging needs. Lately artificial intelligence (AI) seems to have a beginning impact on imaging service. The United Kingdom (UK) has been leading in term of offering master's and PhD programs in Radiography, and by adopting unique approaches to enhance radiographic practices. Denmark is just starting this journey, still without a master's program in Radiography, but the profession has around 15 radiographers with PhD degree, and within the last decade the number of peer reviewed research papers has increased significantly (1).

These changes within the Radiography profession have also been driven by factors such as workforce shortages, increasing age of the workforce all over Europe, and higher demands for specialized imaging such as magnetic resonance imaging (MRI), radionuclide imaging (2) and ultrasound. In Denmark data shows a trend in the rising number of diagnostic imaging procedures with CT scans increasing by approximately 50% during 2003-2014 (3). This is a similar number to the rest of Europe and the UK and the trend seems to be continuing.

While diagnostic radiography has a long history of role development, the formal introduction of advanced practice started in the UK in 2003, following the introduction of the Radiography Skills Mix Strategy (2, 4-6). The importance of enhanced and advanced roles has been demonstrated to positively impact patient care due to reduced waiting times, increased job satisfaction for radiographers, reduced physician workload, and increased cost-effectiveness in the healthcare system (5).

Medical imaging is a very important area of the medicine discipline, with a fast-growing need for imaging which is seeing an increasing number of examinations all over Europe. A survey study from 2024 investigated European radiographers interest in advanced practice and found that 30% indicated an absence of advanced practice options in their country, but 97% responded to have an interest in having advanced practice roles (7), which is also found in other parts of the world (8). A review found that despite feeling unprepared for an advanced practice role, there was a high satisfaction from having this role (9). Not only for the radiographers own career and satisfaction, but also being able to benefit patient care (9). Another recent survey study investigated the opinions of radiologists on advanced practice among radiographers and found that the radiologists concerns with this role may be overcome if radiographers have education and training before new responsibilities are launched (10). An example of this is that since 1995 radiographers in the UK have been trained to interpret X-rays or scans, and subsequent research has found that radiographers perform to the same standard as radiologists (11-13).

Back in 2017 the Health Education England (HEE) published a framework for advanced clinical practice in England, with the aim to enable employers to develop and enhance advanced clinical practice for all the healthcare professionals across 4 pillars of practice, though with differences across professions (14, 15). A second version of the HEE framework

has been published in 2025 with a terminology change from “advance clinical practice” to a simpler version “advanced practice” (16).

In this paper, we delve into the advanced and enhanced radiography practices in two distinct yet progressive healthcare systems: the United Kingdom and Denmark. Both countries have made significant steps in integrating new radiographic technologies and enhancing the roles of radiographers, yet they approach these advancements through different frameworks and methodologies.

Enhanced and Advanced Radiography Practices in the UK

Enhanced clinical practice in radiography in the UK involves radiographers developing higher-level clinical skills beyond those required for initial registration. This practice aims to improve patient care and clinical services by enabling radiographers to take on more complex roles and responsibilities in clinical practice. The College of Radiographers (CoR) and Health Education England (HEE) have established guidelines and frameworks to support radiographers in achieving enhanced practice status (17).

Simplified, enhanced practices refer to a healthcare professional who has developed additional skills and responsibilities beyond their basic qualification, but there is still a skill gap before being recognised as an advanced practitioner. Healthcare professionals with an advanced practice role have expanded clinical responsibility and often hold a master’s or doctoral degree.

Enhanced clinical practice employs a higher level of clinical skills, often supported by postgraduate education such as Postgraduate Certificates (PgCert) or Postgraduate Diplomas (PgDip). It is designed to bridge the gap between initial registration and advanced practice, providing radiographers with the skills needed to perform more specialised tasks**.**

Radiographers in the UK must be registered with the Health and Care Professions Council (HCPC) and meet specific English language requirements. The CoR provides additional guidance and expectations for enhanced-level practice, ensuring that radiographers maintain high standards of patient care and clinical competence. Enhanced practitioners in the UK are expected to work at Agenda for Change pay bands 6 or 7, depending on their roles and responsibilities. They contribute significantly to patient care and clinical services, often taking on responsibilities such as independent reporting and advanced clinical decision-making. Enhanced practitioners may also pursue further qualifications to achieve advanced or consultant practitioner status, which involves higher pay bands and greater responsibilities.

Enhanced clinical practice aims to improve patient care by allowing radiographers to take on more specialized roles, thereby increasing the efficiency and effectiveness of radiographic services. This practice also provides a career development pathway for radiographers, helping to retain skilled professionals within the healthcare system.

Advanced practice in radiography is structured around four key pillars, ensuring that advanced practice radiographers are well-rounded professionals capable of contributing significantly to patient care, education, leadership, and research (see Table 1) (6):

Clinical Practice	Leadership and Management	Education	Research
This pillar involves the practitioner delivering high-quality patient care with a high level of autonomy and complex decision-making. Radiographers at this level are expected to demonstrate expert clinical skills and knowledge.	This pillar includes the practitioner's ability to be involved in leadership roles, managing teams, and contributing to the strategic direction of their departments, by playing a crucial role in driving improvements and innovations in radiographic services.	This pillar involves the practitioner's ability in teaching and mentoring of other healthcare professionals. Advanced practitioners are involved in the education and training of radiography students and other staff, ensuring the dissemination of best practices and new knowledge of the profession. It also includes the education of patients and other healthcare professionals.	This pillar focuses on the practitioner engaging in research activities is essential for advanced practitioners. They contribute to the evidence base of radiographic practice, apply for funding, often leading or participating in research projects to improve patient outcomes and advance the radiography field.

Table 1: Breakdown of the pillars of advanced practice (5)

These four pillars ensure that advanced practice radiographers are well-rounded professionals capable of contributing significantly to patient care, education, leadership, and research [5], making sure the field of radiography continues to evolve.

Advanced practitioners typically complete master's or doctoral-level programs. These programmes cover a wide range of topics, including clinical practice, leadership, education, and research. Education is designed to equip practitioners with the skills and knowledge needed to excel in their advanced roles (6). The Health and Care Professions Council (HCPC) regulates advanced practice roles, ensuring that practitioners adhere to high standards of practice. The College of Radiographers also provides guidance and sets standards for advanced practice, ensuring consistency and quality across the profession (6).

In summary, advanced practitioners have a significant impact on healthcare delivery by providing expert clinical services and making informed decisions, by leading teams and managing services effectively, by educating and mentoring other healthcare professionals, by conducting research and applying new knowledge to clinical practice.

Enhanced and Advanced Radiography Practices in Denmark

Denmark has enhanced and advanced practice roles for radiographers, although it is not labelled as such, and the structure and implementation differ significantly from those in the UK. There are also local differences in Denmark, as the county is divided into 5 regions, whereas the region of Southern Denmark has the highest number of radiographers who have obtained a PhD degree (18), currently. The radiography educational program is placed at university colleges, which is similar to the university of applied sciences, but does not have status as a university. These colleges offer radiography bachelor programmes, but no postgraduate or master level programmes, meaning that radiographers pursuing an academic career typically hold a master's degree in medical health science, public health, engineering or similar rather than in radiography or medical imaging. Hopefully this will change in the future.

The role of the radiographer is a protected title in Denmark and in order to hold the radiography title one most obtain a bachelor's degree. To be authorised as a radiographer a fee of currently 1295 Danish crones (DKR) must be paid to the Danish National Health authorities. All records on health authorisation are public, and can be viewed at a website at Danish patient safety authority (https://stps.dk/) using the Danish Authorisation Register for Healthcare Professionals (Autorisationsregisteret: https://autregweb.sst.dk/authorizationsearch.aspx) (19). The date of birth, name, and date of obtained authorisation is also publicly available for all with an authorisation. The authorisation ensures that radiographers maintain high standards of patient care and clinical competence. It is the radiographer's responsibility to ensure that they are kept up to date when performing their daily clinical work, and typically departments offer to support this requirement. However, there is no requirement of continuing professional development (CPD) in Denmark, and no requirement for registration of CPD activities. Educational activities for maintaining clinical practices, competencies and knowledge is still required, and it is up to each individual radiographer to obtain these via opportunities undertaken in the clinical department.

Enhanced and advanced radiography practices in Denmark are characterised by a focus on enhancing the roles of radiographers through education and research. Enhanced and advanced radiography practices in Denmark are not guided by the National board of Health (Sundhedsstyrelsen), which sets standards and guidelines for the profession. Examples of advanced radiography practices include the mobile radiography service in Kolding hospital (20), which brings imaging to nursing homes improving accessibility and reducing the need for travel for fragile and elderly patients. Mobile radiography has been shown to be beneficial for patient care with high satisfaction among the patient's family and nursing staff (21). By adopting innovative radiography practices leading to better patient outcomes, the radiography profession has also several examples of enhanced and advanced practice in Radiography that have a significant impact on healthcare.

Summary

Advancements in radiography practices in the UK and Denmark demonstrate the potential for improved patient outcomes and healthcare delivery, with very different approaches. The UK focuses on a comprehensive framework with the 4 pillars: clinical practice, leadership, education, and research, while Radiography in Denmark is still a young profession and just starting this journey. Both countries recognise the importance of continuous education and training for radiographers in clinical practice.

In the UK and Denmark, universities or university colleges collaborate with hospitals on clinical placement, to ensure that radiography students are ready to be part of the current practices and emerging trends. Radiographers often work closely with other healthcare professionals, fostering a collaborative environment. However, both countries face challenges, such as the integration of AI in radiography which is still in its early stages in both countries. Person-centred care is a cornerstone of radiographic practice, which includes the provision of clear communication about procedures and attending to the time-sensitive and specific needs of each individual patient (22), this ensures that patients receive high-quality care and that radiographers can contribute more effectively to the healthcare team. Some common challenges faced by both countries include regulatory issues and the need for standardisation. However, there are also opportunities for collaboration and knowledge sharing. By learning from each other's experiences, we can further develop the radiography profession.

Looking ahead, the future of radiography appears bright. Continued investment in technology and education will help addressing current challenges.

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