

Evidence Brief: Healthcare Science

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Produced by the Knowledge Management team Evidence Briefs offer an overview of the published reports, research, and evidence on a workforce-related topic.

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There may have been an update to this Evidence Brief - to check you are reading the most current version please see the links below:

- [Complete Evidence Brief list – link for Workforce, Training and Education staff](#)
- [Complete Evidence Brief list – link for External staff](#)

Healthcare science covers a broad range of topics and professions. There are also more detailed [evidence briefs](#) on the following topics:

- Cancer
- Cancer Diagnostics
- Echocardiography
- Genomics
- Haematology
- Imaging and Radiology
- Ophthalmology
- Pathology

*Help accessing articles or papers

Where a report/ journal article or resource is freely available the link has been provided. If an NHS OpenAthens account is required this has been indicated. It has also been highlighted if only the abstract is available. If you do not have an OpenAthens account you can [self-register here](#).

If you need help accessing an article, or have any other questions, contact the Knowledge Management team for support england.knowledgemanagement@nhs.net

Key publications – the big picture

[Good practice guidance for enabling equitable access to clinical imaging referrals for registered healthcare professionals working in advancing practice roles](#)

The Royal College of Radiologists, 2025

This good practice guidance and accompanying infographic outlines principles for ensuring more consistent and equitable access to clinical imaging requests for registered healthcare professionals working in multi-professional enhanced, advanced, or consultant practice roles.

[Your future healthcare scientists](#)

NHS Employers, March 2024

Learn more about the different routes to recruiting your healthcare science workforce and ways to increase your healthcare science supply.

[Healthcare science: discovery, innovation, and adapting our NHS](#)

NHS England, 15 March 2024

In this blog, shared for Healthcare Science Week (11 to 15 March 2024), Professor Dame Sue Hill, Chief Scientific Officer for NHS England considers how healthcare science has shaped the NHS to meet new challenges.

[Clinical Radiology Census 2024](#)

Royal College of Radiologists, 2024

Our census report presents a comprehensive picture of the clinical oncology workforce each year, and enables us to speak decisively about the issue.

[Radiology Unlocked: The Global Radiologist Report 2025](#)

Everlight Radiology, 2025

Read the results of our global survey of over 700 Radiologists working across 50 countries, delving into the challenges and opportunities they see within the sector.

[AI deployment fundamentals for medical imaging](#)

The Royal College of Radiologists, 2024

The AI deployment fundamentals for medical imaging guidance was developed by an expert panel who identified minimum standards for providers to deploy artificial intelligence (AI) solutions in radiology and focuses on the period between the algorithm achieving regulatory approval and its business-as-usual deployment.

[NHS Long Term Workforce Plan](#)

NHS, June 2023

The first comprehensive workforce plan for the NHS, putting staffing on a sustainable footing and improving patient care. It focuses on retaining existing talent and making the best use of new technology alongside the biggest recruitment drive in health service history.

See page 48 "Healthcare Scientist Training"

[The infection sciences workforce: a meeting pathology demand briefing](#)

The Royal College of Pathologists; British Infection Association, May 2023

This briefing contains the findings of the survey, open between April and August 2021, which was designed to be completed by 1 individual for each acute NHS organisation in the UK by the service lead for microbiology, virology or infectious diseases, or the medical director. The results of the survey highlight the

challenges facing medical microbiology. We have made recommendations for solutions to those challenges and set out the commitments the College is making to help alleviate the problems facing medical microbiologists.

Topol Review: Progress on the recommendations

Health Education England, February 2023

Published in 2019, the Topol Review presented a compelling vision for preparing the healthcare workforce to deliver the digital future, where technology can help address the big healthcare challenges, through augmenting the workforce, driving productivity, and ultimately releasing more time to care for patients.

Radiotherapy Radiographic Workforce Census 2023

The Society of Radiographers, 2023

Each year the Society of Radiographers undertakes a UK-wide radiotherapy radiography workforce census to gain intelligence about the radiotherapy radiographic workforce.

To accompany the [report](#), we also publish a [spreadsheet](#) with the principal figures and the [questionnaire](#) used to gather data.

Homeworking for radiologists

The Royal College of Radiologists, 2023

The massive expansion of home reporting by radiologists proposed by Getting It Right First Time (GIRFT) and accelerated by COVID has brought many changes to the specialty. This document is intended to enable departments to harness such changes for better patient outcomes. While home reporting offers flexibility and reduced commuting as well as uninterrupted reporting time, an adequate on-site presence remains important to provide leadership for teams and appropriate input for clinical colleagues and trainees.

Healthcare science – education and training provision: baseline review

Scottish Government, October 2022

This baseline review explores healthcare science education in Scotland to better understand this landscape. It has resulted in 6 key themes which will inform the national workforce strategy for health and social care in Scotland commitment to undertake a HCS Education scoping review.

Return to practice for healthcare professionals

NHS Employers, 13 May 2022

Information and resources on return to practice for healthcare professionals, practising psychologists and healthcare scientists.

T Levels in health and healthcare science report: successful industry placement models in action

Northern Care Alliance NHS FT, 2022

The report commissioned by the Gatsby Charitable Foundation, brings together case study models for placement management, developed to suit the requirements of NHS institutions working with their local T Level providers. These models range from individual agreements between a single T Level provider and an NHS organisation, through to Integrated Care System agreements between 25 or more partner organisations.

Pathology Getting It Right First Time

GIRFT, September 2021

The pathology workforce is primarily made up of medically qualified pathologists, clinical scientists and biomedical scientists, working in multidisciplinary teams (MDTs) across the pathology specialties.

See p. 114 for Workforce

Radiology Getting It Right First Time

GIRFT, November 2020

Recent years have seen a consistent, ongoing growth in demand for radiology services. In 2012/13, there were just over 35 million radiological examinations performed across the NHS in England. By 2018/19, that had risen to over 43 million. The fastest growth has been in the more complex modalities – MRI and CT. In April 2012, there were 250,000 CT scans undertaken a month; by March 2019, this had doubled. For MRI, the increase over the same period was from around 170,000 a month to 320,000. There seems little doubt that this pattern of growth will continue. Radiology is being used earlier and more extensively in the diagnostic pathway. It is at the heart of a growing number of screening programmes and health checks. At the same time, the use of interventional radiology is soaring, offering incredibly precise and minimally invasive surgery.
See section 2 "Maximising capacity"

Estimating the cost of growing the NHS cancer workforce in England by 2029

Cancer Research UK, October 2020

Over the last 50 years, the UK has made significant progress in improving survival outcomes for people diagnosed with cancer. In the 1970s, only 1 in 4 cancer patients would survive their disease for ten years or more. By 2010, this had risen to 2 in 4, and survival outcomes continue to improve.¹ There are several drivers for this, from the introduction of screening programmes and innovative treatments to ongoing improvements to health care pathways – all of which has been underpinned by the continued and tireless efforts of staff from across the NHS.

[See also supplementary information pack](#)

Genome UK: the future of healthcare

GovUK, September 2020

Strategy setting out the vision to extend the UK's leadership in genomic healthcare and research.

Case Studies

Improving diagnostics

NHS Providers, February 2025

The South West London Acute Provider Collaborative diagnostics programme was established with the aim of leading the renewal and recovery of diagnostic services across South West London and to ensure the growing demand for diagnostic services could be met.

Case Study Series: A Strategic Approach to Workforce, Training and Education for Cardiac Physiology across London NHS

Futures log in required to view

NHSE WT&E London HCS Project Leads, March 2024

The purpose of this case study series is to explore how different Cardiac Physiology services across London are addressing the current workforce challenges and how they have been able to overcome any barriers to prioritising training and education. By sharing with colleagues, we hope to bring new services onboard, promote collaboration and equity in participation of education programmes and provide peer support to those wanting to increase their intake of trainees. Permission has been gained from all individuals mentioned in this document to share this case study series.

Extended phlebotomy service

CQC, April 2022

Leeds Teaching Hospitals NHS Trust (LTHT) has five hospital sites. Every week the phlebotomy team sees an average of 10,000 patients across those sites.

Radiography skill mix to increase imaging capacity and capability

CQC, April 2022

Mid Yorkshire Hospitals is a large multicentre acute NHS trust.

It provides a full range of secondary care services, and tertiary burns and spinal injuries rehabilitation services.

The driver for change was increased imaging referrals, particularly in CT and MRI. This, combined with a drive to decrease waiting times, placed pressure on the radiology department. To develop new pathways and utilise roles effectively the trust needed a different way of staffing the department.

Providing a consultant radiographer to a breast imaging services

CQC, April 2022

Shrewsbury and Telford Hospital NHS Trust had a shortage of radiologists. This was causing problems to the way breast imaging services were delivered.

Hosting under 18 T Level Industry Placements

NHS Employers, 2022

Yeovil District Hospital NHS Foundation Trust (YDH) worked in partnership with its local college, Yeovil college, to pilot industry placements with BTEC health and care students. These industry placements gave local students an opportunity to experience working in a healthcare setting for an extended period of time (45 days). This meant that they were able to see and understand a healthcare setting, become part of a team and gain valuable experience in the NHS.

Delivering clinical T Level industry placements: Frimley Health NHS Foundation Trust,

NHS Employers, 13 January 2021

Find out how Frimley Health NHS Foundation Trust piloted T Level industry placements in a range of clinical settings.

Healthcare science case studies

National School of Healthcare Science

- [Diagnostic Radiology and Radiation Protection Physics](#)
- [Cardiac Science](#)
- [Medical Device Risk Management](#)
- [Biomedical Science](#)
- [Biomedical Science](#)
- [Anatomical Pathology](#)
- [Clinical Fellow](#)

STP case studies

National School of Healthcare Science

PTP case studies

National School of Healthcare Science

HSST case studies

National School of Healthcare Science

Apprenticeship case studies

National School of Healthcare Science

The Star for workforce redesign

More resources and tools are available by searching for "healthcare science" in [the Star](#)

Statistics

You can find relevant statistics on the [Health and Care Statistics Landscape](#) under “**Health and Care**”

National Data Programme

Workforce, Training and Education staff can look at the [National Data Warehouse \(NDL\)](#) SharePoint site to find out more about datasets and Tableau products.

Published Peer Reviewed Research

Advanced Practice

[The extended and advanced clinical practices of radiographers worldwide: A scoping review](#) Abstract only*

Journal of Medical Imaging and Radiation Sciences 56(2), 2025
Aims: This scoping review aimed to (1) map the global evidence on extended and advanced clinical practices (ACP) performed by radiographers, and (2) provide an overview of the pillars (clinical practice, leadership and management, education, and research) they relate to, as well as the radiology areas and the geographical location where they were developed. Method(s): Articles were searched in MEDLINE, CINAHL and Embase, and grey literature in ProQuest Dissertation and Theses.

[Role extension in advanced ultrasound practice: A framework approach and case study](#)

Ultrasound, 31(1), 2023

Introduction: Role extension into novel areas of ultrasound practice can be challenging for health care professionals.

Expansion into existing areas of advanced practice typically occurs using established processes and accredited training; however, in areas where there is no formal training, there can be a lack of support for how to develop new and progressive clinical roles. Topic Description: This article presents how the use of a framework approach for establishing areas of advanced practice can support individuals and departments with safely and successfully developing new roles in ultrasound. The authors illustrate this via the example of a gastrointestinal ultrasound role, developed in an NHS department.

The evolution from cardiac physiologists to clinical scientists in the UK: a guide to attaining equivalence

Publication Details: Echo research and practice, 6(4), 2019
At its inception, transthoracic echocardiography (TTE) was employed as a basic screening tool for the diagnosis of heart valve disease and as a crude indicator of left ventricular function. Since then, echocardiography has developed into a highly valued non-invasive imaging technique capable of providing extremely complex data for the diagnosis of even the subtlest cardiac pathologies. Its role is now pivotal in the diagnosis and monitoring of heart disease. With the evolution of advanced practice and devolving care, ordinarily performed by senior doctors, to the cardiac physiology workforce in the UK, significant benefits in terms of timely patient care and cost savings are possible.

Developing radiographer roles in the context of advanced and consultant practice

Journal of Medical Radiation Sciences, 60(1), 2013
Skill-mix initiatives have provided opportunities for radiographers to develop roles and achieve their potential, thus contributing to radiographer retention rates and increased job satisfaction. This reflective article explores two radiographic roles within an interprofessional context including the implications for

confidence, competence, and future sustainability. These were reporting roles which extended into two modalities, one into bone densitometry and another into ultrasound. This article discusses how successful skill mix can benefit the individual, their department, and NHS organization and that role expansion can develop a more dynamic and resourceful workforce with transferability of skills and attributes.

Capacity

Ultrasound clinical teaching capacity in England: A scoping exercise

26(1), 2020

INTRODUCTION: The United Kingdom has a sonographer shortage. Health Education England are working with stakeholders to address these shortages and increase clinical capacity for sonographer education. The aims of this survey were to ascertain current sonographer staffing levels, estimate staffing requirements in five years' time and review current clinical placement capacity.

Staffing in hospital transfusion laboratories: UKTLC surveys show cause for concern Abstract only*

Transfusion medicine (Oxford, England), 29(2), 2019

OBJECTIVES: To monitor minimum standards in hospital transfusion laboratories in relation to qualifications, training, competency and the use of information technology over time against published recommendations., BACKGROUND: The United Kingdom Transfusion Laboratory Collaborative was formed in 2006 with representatives from relevant organisations and has published standards for transfusion laboratory practice.

Personnel flux and workplace anxiety: Personal and interpersonal consequences of understaffing in UK ultrasound departments

Radiography 25(1), 2019

INTRODUCTION: By 2013, the UK government's Migration Advisory Committee had determined sonography to be a formal shortage speciality, and understaffing remains a key concern for research in the domain. This paper, emergent of a qualitative study funded by Health Education North West, explores unit managers' perspectives on the present state of UK ultrasound. The focus herein falls upon the personal and interpersonal consequences of this circumstance for individuals working in specific understaffed departments.

Optimising diagnostics through imaging informatics: costs and opportunities

British Journal of Healthcare Management 23(4), 2017

Increasing diagnostic capacity is a national priority to expedite the timeliness and appropriateness of patient treatment interventions. Imaging-encompassing a range of technologies including X-ray, CT, MRI, nuclear medicine and ultrasound-is a key diagnostic service and central to decision-making in most, if not all, disease pathways. However, imaging is an expensive discipline accounting for an estimated 3-5 per cent of the annual NHS budget. As a result, it is imperative that we maximise service efficiency while optimising patient outcomes.

Career Pathways

A study to investigate undergraduate diagnostic radiographer preferences and expectations of clinical role development:

Quantitative findings Abstract only*

Radiography 28(2), 2022

Abstract: INTRODUCTION: Whilst United Kingdom (UK) student ambitions for role development have been surveyed previously,

no literature has explored their specialisation preferences. This study aimed to explore these ambitions and preferences in final year diagnostic radiography undergraduates at a Higher-Education Institute (HEI) in the North-West of England.

Clinical scientists' early career choices and progression: an exploratory mixed methods study

BMC health services research, 21(1), 2021

Abstract: BACKGROUND: Understanding the influences on healthcare professionals' career choices and progression can inform interventions to improve workforce retention. Retention of health professionals is a high priority worldwide, in order to maintain expertise and meet the needs of national populations. In the UK, investment in clinical scientists' pre-registration education is high and the need to retain motivated scientists recognised.

Improving support for young biomedical scientists Abstract only*

Science (New York, N.Y.), 360, 2018

Over the past several years, we and others in the biomedical research community have become increasingly concerned that younger scientists are not being adequately supported as independent academic investigators and that, of equal importance, these newly launched investigators are being strongly discouraged from tackling novel scientific problems (1–6). Both issues can prevent talented trainees from aspiring to careers in biomedical research, despite the extraordinary opportunities offered by new technologies and recent discoveries. We view this situation as an existential threat to our profession, demanding that we urgently confront the underlying problems.

Education and Training

Identification of a Theory-Practice Gap in the Education of Biomedical Scientists

British Journal of Biomedical Science 81, 2024

Introduction: The Biomedical Scientist (BMS) role is established in healthcare, working in laboratory environments to provide diagnostic testing and to monitor treatment effects on a patients' health. The profession is subject to several professional standards which highlight the importance of working in the best interests of the patient and service user. However, Biomedical Scientists have little or no patient contact. This study aimed to determine how Biomedical Scientists evidence that they meet the professional standards and support the achievement of patient outcomes.

Evaluation of two Massive Open Online Courses (MOOCs) in genomic variant interpretation for the NHS workforce

BMC Medical Education 23(1), 2023

BACKGROUND: The implementation of the National Genomic Medicine Service in the UK has increased patient access to germline genomic testing. Increased testing leads to more genetic diagnoses but does result in the identification of genomic variants of uncertain significance (VUS). The rigorous process of interpreting these variants requires multi-disciplinary, highly trained healthcare professionals (HCPs). To meet this training need, we designed two Massive Open Online Courses (MOOCs) for HCPs involved in germline genomic testing pathways: Fundamental Principles (FP) and Inherited Cancer Susceptibility (ICS).

A Review of Clinical Laboratory Education, Training and Progression: Historical Challenges, the Impact of COVID-19 and Future Considerations

British journal of biomedical science, 80, 2023

This review highlights pre- and post-pandemic training and assessment for clinical laboratory professionals, with particular emphasis on Biomedical Scientists, outlining recent improvements among a history of challenges. There is increasing interest surrounding this vital workforce, accelerated thanks to the pandemic. This new public platform has emphasised the importance of quality diagnostic services in the patient pathway and in the response to national crises. The ability to maintain a quality service that is prepared for the future is grounded in the effective training and development of its staff. All of which can only be achieved with a workforce that is sustainable, invested in, and given a voice.

Snapshot of ultrasound imaging in basic anatomy and physiology teaching in the United Kingdom and Republic of Ireland: perceptions, obstacles, and solutions

Advances in Physiology Education, 46(4), 2022

We have used ultrasound imaging and technology as a tool for nonclinical teaching of basic physiological concepts for several years and are aware anecdotally that only a few others in the United Kingdom and Republic of Ireland (UK/ROI) are also using ultrasound with this intention in physiology and anatomy teaching. To better understand what areas ultrasound is used for by others, along with what barriers might exist to its use, we reached out to colleagues in UK/ROI institutions instructing on anatomy and physiology courses by asking them to complete a survey regarding their experiences.

What is the scope of teaching and training of undergraduate students and trainees in point of care testing in United Kingdom universities and hospital laboratories?

PloS one, 17(8), 2022

Point of care testing (POCT) is an analytical test performed by a healthcare professional outside of a conventional laboratory. The global POCT market was valued at US\$ 23.16 billion in 2016 and

is forecasted to grow to US\$ 36.96 billion in 2021. This upward trend for POCT has increased workload for pathology departments who manage POCT. This research aims to characterize and analyse the teaching and training of POCT at United Kingdom (UK) universities on Institute of Biomedical Science (IBMS) accredited biomedical science degrees, and at UK hospital laboratories.

Enhancing trainee clinical scientists' self-regulated learning in the workplace

The clinical teacher, 19(5), 2022

BACKGROUND: Trainee health professionals must be competent self-regulated learners, particularly when learning in busy, unpredictable clinical settings. Whilst research indicates self-regulated learning (SRL) is influenced both by learners' individual actions and their interactions with others, how these combine to foster SRL requires further exploration. We have used Zimmerman's learner-focused SRL model and the situative perspective of communities of practice (CoPs) to investigate how UK trainee clinical scientists regulate their learning. Our aims were to develop a holistic understanding of SRL in the clinical workplace incorporating both individual and social aspects and to suggest ways of maximising learning for trainee clinical scientists and other health professionals.

Teaching, research or balanced? An exploration of the experiences of biomedical scientists working in UK medical schools

FEBS open bio, 11(11), 2021

Abstract: Driven by demand for high standards in university education, efforts have been made in the UK to address the perceived imbalance between teaching and research. However, teaching is still perceived by many as having less credibility and is attributed less importance. The purpose of our research was to explore how distinct types of academic job profiles ('research' or

'education' focused, or 'balanced') impact on biomedical scientists' perceptions of the lecturer role. Specifically, we investigated the experiences of biomedical scientists in 'post-1990' medical schools, which are known for their commitment to excellence in both research and education.

Genomic Education at Scale: The Benefits of Massive Open Online Courses for the Healthcare Workforce

Frontiers in genetics, 10, 2019

Abstract: To support the delivery of the UK's 100,000 Genomes Project, Health Education England's Genomics Education Programme developed a suite of resources, including a 3-week Massive Open Online Course (MOOC) on whole genome sequencing via the FutureLearn platform. This MOOC is a synchronous learning event, with course educators and mentors (NHS healthcare science trainees in genomics) facilitating the experience in real time. Crucially, the platform allows participants to interact and learn from each other's experiences.

Training in molecular cytopathology testing Abstract only*

Cytopathology: official journal of the British Society for Clinical Cytology, 29(1), 2018

Abstract: Training in molecular cytopathology testing is essential in developing and maintaining skills in modern molecular technologies as they are introduced to a universal health care system such as extant in the UK and elsewhere. We review the system in place in Northern Ireland (NI) for molecular testing of solid tumours, as an example to train staff of all grades, including pathologists, clinical scientists, biomedical scientists and equivalent technical grades. We describe training of pathologists as part of the NI Deanery medical curriculum, the NI training programme for scientists and laboratory rotation for Biomedical Scientists. Collectively, the aims of our training are two-fold: to provide a means by which individuals may extend their

experience and skills; and to provide and maintain a skilled workforce for service delivery.

Equality, Diversity and Inclusion

Career self-efficacy disparities in underrepresented biomedical scientist trainees

PLoS ONE 18(3), 2023

The present study examines racial, ethnic, and gender disparities in career self-efficacy amongst 6077 US citizens and US naturalized graduate and postdoctoral trainees. Respondents from biomedical fields completed surveys administered by the National Institutes of Health Broadening Experiences in Scientific Training (NIH BEST) programs across 17 US institutional sites. Graduate and postdoctoral demographic and survey response data were examined to evaluate the impact of intersectional identities on trainee career self-efficacy.

Cultural competence in NHS hearing aid clinics: a mixed-methods case study of services for Deaf British sign language users in the UK

BMC Health Services Research 23(1440), 2023

BACKGROUND: This study identified and explored how National Health Service (NHS) hearing aid clinics address cultural competence concerning Deaf British Sign Language (BSL) users. This was approached by (i) investigating how organisational processes meet the needs of Deaf signers from a hospital and hearing aid clinic perspective, (ii) analysing policies and guidelines to investigate if they equip practitioners to meet the needs of Deaf signers and (iii) exploring with practitioners who work in hearing aid clinics about their experiences of working with Deaf signers.

Extended Roles

Clinical-scientist-led transoesophageal echocardiography (TOE): using extended roles to improve the service

BMJ Open Quality 12(3), 2023

At the North West Anglia NHS Foundation Trust, we perform transoesophageal echocardiography (TOE), a semi-invasive diagnostic test using ultrasound for high-quality heart imaging. TOE allows accurate diagnosis of serious heart problems to support high-quality clinical decision-making about treatment pathways. The procedure can be lengthy and is traditionally performed by a consultant cardiologist, who typically has multiple commitments. This constrains patient access to TOE, leading to waits from referral to test, delaying treatment decisions.

Genetic Counsellors

The experiences of UK-based genetic counsellors working in mainstream settings

European journal of human genetics: EJHG, 30(11), 2022

Abstract: Most UK-based genetic counsellors (GCs) work within clinical genetics services; yet there is a small and expanding group of GCs working within other clinical specialties, termed "mainstream" GCs. To our knowledge there have been no projects to date examining the experiences of mainstream GCs working in the UK. The aim of this workforce evaluation was to explore the experiences of mainstream GCs.

The role of genetic counsellors in genomic healthcare in the United Kingdom: a statement by the Association of Genetic Nurses and Counsellors

European journal of human genetics : EJHG, 25(6), 2017

Abstract: In the United Kingdom, genetic counsellors work together with clinical geneticists and clinical scientist colleagues within specialist genetics services, but they also often work in

multidisciplinary teams (MDTs) outside of such services. There, they contribute genetic knowledge together with expert understanding of how to communicate genetic information effectively. They can offer education and support to the MDT, while providing management advice for both affected patients and the extended at-risk family members. As genomic technologies are implemented across many disciplines within healthcare, genetic counsellors are playing a key role in enabling non-genetic health professionals learn, understand and integrate genomic data into their practice. They are also involved in curriculum development, workforce planning, research, regulation and policy creation - all with the aim of ensuring a robust evidence base from which to practise, together with clear guidelines on what constitutes competence and good practice.

A prospective cohort study assessing clinical referral management & workforce allocation within a UK regional medical genetics service

European journal of human genetics: EJHG, 23(8), 2015
Abstract: Ensuring patient access to genomic information in the face of increasing demand requires clinicians to develop innovative ways of working. This paper presents the first empirical prospective observational cohort study of UK multi-disciplinary genetic service delivery. It describes and explores collaborative working practices including the utilisation and role of clinical geneticists and non-medical genetic counsellors. S

Genomics

"I'm quite proud of how we've handled it": health professionals' experiences of returning additional findings from the 100,000 genomes project

European Journal of Human Genetics : EJHG, 2024
Participants in the 100,000 Genomes Project (100kGP) could consent to receive additional finding (AF) results, individual

variants relating to genes associated with susceptibility to cancer and familial hypercholesterolemia (FH). In the study reported here, qualitative interviews were used to explore the experiences of National Health Service (NHS) professionals from across England who were tasked with returning over 80,000 "no AF" results and 700 positive AF results to 100kGP participants.

Health and Wellbeing

An occupational health survey of the UK's mortuary workforce

Abstract only*

Occupational Medicine 73(4), 2023

Background: Mortuaries are predominantly staffed by anatomical pathology technologists (APTs) and pathologists, and the work they undertake carries implicit health risk due to its nature. Until now there has not been a nationwide assessment of the occupational health of these essential workers in the UK.

Challenges of a negative work load and implications on morale, productivity and quality of service delivered in NHS laboratories in England

Asian Pacific journal of tropical biomedicine, 4(6), 2014

Abstract: The National Health Service (NHS) is a term used to describe the publicly funded healthcare delivery system providing quality healthcare services in the United Kingdom. There are several challenges militating against the effective laboratory service delivery in the NHS in England. Biomedical scientists work in healthcare to diagnose disease and evaluate the effectiveness of treatment through the analysis of body fluids and tissue samples from patients. They provide the "engine room" of modern medicine with 70% of diagnosis based on the laboratory results generated by them. This review involved the search of literature for information on working condition of biomedical scientist in the NHS in England.

New Roles

UK physician associate primary care placements: staff and student experiences and perceptions

International journal of medical education, 9, 2018

Abstract: Objectives: To provide an insight into the experiences and perceptions of physician associate students and primary care staff involved in primary care educational placements in the United Kingdom. Method(s): A qualitative study was conducted. Data were collected from focus groups and semi-structured interviews with eight first year physician associate students and six primary care staff in two general practice surgeries in East Sussex, United Kingdom. Recruitment was via purposeful sampling. Thematic Analysis was used to identify themes.

Leadership

Enhanced model for leadership development for trainees and early career health professionals: insights from a national survey of UK clinical scientists Abstract only*

BMJ leader, 6 (3), 2022

INTRODUCTION: The importance of shared or distributed leadership in healthcare is recognised; however, trainees, early career professionals and others for whom the exercise of leadership is a recent development report being underprepared for leadership roles. Trainee clinical scientists exemplify such groups, being both early in their career and in a profession for which clinical leadership is less well established. Their insights can inform understanding of appropriate forms of leadership development for health professionals.

Next Generation Leaders Programme: A Multi-Methods Evaluation of a Leadership Development Programme for Biomedical Researchers

Advances in medical education and practice, 13, 2022

Abstract: Background: Biomedical scientists have become de facto leaders for their research teams. Theories of expert leadership suggest that the specialist knowledge and credibility these researcher-leaders bring to their roles can lead to improved performance. Formal leadership development for biomedical researchers remains uncommon, and it is unclear whether existing leadership development programmes achieve improved individual and organisational outcomes. Our study evaluates the effectiveness of a single centre leadership development programme for biomedical researchers using a mixed-methods approach.

Learning from Covid-19

"It has been the most difficult time in my career": A qualitative exploration of UK obstetric sonographers' experiences during the COVID-19 pandemic

Radiography 29(3), 2023

Introduction: Substantial changes were made to the provision of pregnancy ultrasound services during the COVID-19 pandemic with the intention of minimising virus transmission and maintaining service continuity. Published literature describing the impact of the pandemic on obstetric sonographers is predominantly quantitative in nature, however statistics cannot fully convey sonographers' voices. This study aimed to gain a deeper understanding of the lived experiences of UK obstetric sonographers performing pregnancy ultrasound scans during the pandemic.

Participatory peer research exploring the experience of learning during Covid-19 for allied health and healthcare science students

PLoS ONE, 17(10), 2022

Introduction The teaching and learning experience of allied health and healthcare science students has altered because of the Covid-19 pandemic. Limited research has explored the

experience on the future healthcare workforce using participatory research design. The aim of this study was to explore the impact of a global pandemic on the clinical and academic experiences of healthcare student using a co-production approach with student peer researchers.

The impact of the COVID-19 pandemic on clinical guidance and risk assessments, and the importance of effective leadership to support UK obstetric sonographers

Journal of medical imaging and radiation sciences, 53(4), 2022
INTRODUCTION: The COVID-19 pandemic had a profound impact on the provision of obstetric ultrasound services, leading to the publication of new guidance and requirement for individual departmental risk assessments in the UK. The impact of these changes on clinical practice for UK obstetric sonographers is not currently well reported in published literature.

Impact of COVID-19 on nuclear medicine in the UK Abstract only*

Nuclear medicine communications, 42(2), 2021
Abstract: PURPOSE: COVID-19 brought about unprecedented challenges to healthcare, with nuclear medicine (NM) being no exception. The British Nuclear Medicine Society (BNMS) COVID-19 survey assessed the impact of the first wave of pandemic on NM services in the UK. With COVID-19 resurge compounded by seasonal winter pressures, we reflect and share lessons learnt from the first wave of pandemic to guide future strategy.,

New ways of working

Best practice standards for the delivery of NHS infection services in the United Kingdom

Clinical infection in practice, 12, 2021
Infection expertise in the NHS has historically been provided predominantly by hospital-based medical microbiologists

responsible for provision of diagnostic services and advice to front-line clinicians. While most hospitals had consultant-led microbiology departments, infectious diseases departments were based in a small number of specialist centres. The demand for infection expertise is growing in the NHS, driven by advances in medical care, increasing awareness of the impact of antibiotic resistant and healthcare associated infections and threats from emerging infectious diseases. At the same time diagnostic services are being reorganised into pathology networks.

Andrology and accreditation - an opportunity for Cytologists

Abstract only*

Cytopathology, 2019

This article describes the development (from an existing service) and subsequent United Kingdom Accreditation Service (UKAS) accreditation of andrology testing in a District General Hospital setting, describing key areas for development and utilising cytopathology and histopathology staff of various grades and thus providing one avenue of skill redeployment for those cytopathology staff who will no longer provide morphological screening expertise to the CSP. This article is protected by copyright. All rights reserved.

Pathologist's assistant (PathA) and his/her role in the surgical pathology department: a systematic review and a narrative synthesis Full text available with NHS OpenAthens account*

Virchows Archiv: an international journal of pathology, 472(6), 2018

In recent decades, various highly qualified individuals have increasingly performed tasks that have historically been handled by physicians with the aim of reducing their workload. Over time, however, these "physician assistants" or "physician extenders" have gained more and more responsibilities, showing that specific tasks can be performed equally skilfully by specialised health care professionals. The pathologist's assistant (PathA) is

a highly qualified technician who works alongside the pathologist and is responsible for the grossing and autopsies.

Evidence for models of diagnostic service provision in the community: literature mapping exercise and focused rapid reviews

NIHR Journals Library, 2016

BACKGROUND: Current NHS policy favours the expansion of diagnostic testing services in community and primary care settings., OBJECTIVES: Our objectives were to identify current models of community diagnostic services in the UK and internationally and to assess the evidence for quality, safety and clinical effectiveness of such services. We were also interested in whether or not there is any evidence to support a broader range of diagnostic tests being provided in the community.

Patient and staff experience

Blood sampling in adult critical care: a mixed methods study

Abstract only*

International journal of orthopaedic and trauma nursing, 45, 2022

Abstract: There are few studies exploring blood sampling practice in critical care. In particular, the views of nursing staff are missing from the literature. The aim of this mixed methods study was to understand blood sampling practice at a single centre National Specialist Orthopaedic NHS trust in London, England.

Recontacting in clinical practice: an investigation of the views of healthcare professionals and clinical scientists in the United Kingdom

European journal of human genetics: EJHG, 25(3), 2017

This article explores the views and experiences of healthcare professionals and clinical scientists in genetics about the existence of a duty and/or responsibility to recontact former

patients when the genetic information relevant to their health, or that of family members, changes in a potentially important manner.

Recruitment and retention

Understanding the professional factors that impact the retention of pathology workers in regional, rural and remote Australia

Australian Journal of Rural Health 32(6), 2024

Objective: The objective of this study was to determine what professional factors impact the retention of pathology workers in regional, rural and remote Australia. Design(s): A cross-sectional survey was used to collect data regarding the professional factors that impact the retention of regional, rural and remote pathology workers in Australia (n = 95). The survey focused on pathology workers' satisfaction with specific professional factors and how long they intended to stay in their current position. Setting(s): Regional, rural and remote (MM2-7) pathology laboratories in Australia.

The Most Valuable Resource Is Time: Insights From a Novel National Program to Improve Retention of Physician-Scientists With Caregiving Responsibilities Abstract only*

Academic medicine: journal of the Association of American Medical Colleges, 94(11), 2019

Abstract: PURPOSE: To enhance understanding of challenges related to work-life integration in academic medicine and to inform the ongoing implementation of an existing program and the development of other interventions to promote success of physician-scientists.

Regulation and Professional Identity

Establishment of clinical exercise physiology as a regulated healthcare profession in the UK: a progress report

BMJ Open Sport & Exercise Medicine 10(2), June 2024

In 2021, a 'call to action' was published to highlight the need for professional regulation of clinical exercise physiologists to be established within UK healthcare systems to ensure patient safety and align training and regulation with other health professions. This manuscript provides a progress report on the actions that Clinical Exercise Physiology UK (CEP-UK) has undertaken over the past 4 years, during which time clinical exercise physiologists have implemented regulation and gained formal recognition as healthcare professionals in the UK. objectives for the future advocacy development of this workforce in the UK.

Professional identity and role perception of Radiographers and Clinical Technologists in Nuclear Medicine - An exploratory qualitative study Abstract only*

Radiography 30(1), 2024

Introduction: An awareness of Professional Identity (PI), an individual's identity in relation to their professional group, and Role Perception (RP), an individual's view of their specific role, may enable safe and effective practice by providing an understanding of professional boundaries, behaviours and activities. This research aimed to explore and gain an understanding of the PI and RP of Radiographers and Clinical Technologists working as Nuclear Medicine Technologists (NMT's).

Research

Research culture, barriers and facilitators within the radiography workforce in the UK - results of a national survey

Radiography 31(4), 2025

Introduction: Research is vital for diagnostic and therapeutic radiographers, providing the evidence base for disease diagnosis, screening, surveillance, radiotherapy planning, delivery, and treatment. Despite its benefits in improving patient outcomes and imaging services, little is known about the research culture barriers and facilitators within the UK radiography workforce.

Development of a framework and research impact capture tool for nursing, midwifery, allied health professions, healthcare science, pharmacy and psychology (NMAHPPs)

BMC Health Services Research 23(1), 2023

Background: There is an ambitious target to create a UK clinical academic workforce representing 1% of clinicians from nursing, midwifery, the allied health professions, healthcare science, pharmacy and psychology (NMAHPPs). Understanding and recording the impact that clinical academics make across healthcare services is crucial if we are to grow, value and support this highly skilled workforce group. However, it is currently difficult to systematically record, collate and report the impacts associated with NMAHPP research activity. The aims of this project were to i) develop a framework outlining the impacts that were important for key stakeholder groups, and ii) create and pilot a research impact capture tool to record these impacts.

Service implementation

Implementing a clinical scientist-led screening clinic for hypertrophic and dilated cardiomyopathies

Echo Research and Practice 11(1), 2024

Background: The burden of screening for inherited cardiac conditions on health services grows ever larger, with each new diagnosis necessitating screening of additional family members. Screening these usually asymptomatic, low-risk individuals is currently performed by consultant cardiologists, consuming vital clinic resources that could otherwise be diverted to sicker patients requiring specialist consultant input. Clinical scientists now constitute a highly skilled and often underutilised group of individuals with training in areas such as clinical evaluation, 12-lead electrocardiography (ECG) interpretation, and echocardiography.

Delivery of a national prenatal exome sequencing service in England: a mixed methods study exploring healthcare professionals' views and experiences

Frontiers in Genetics 15, 2024

Introduction: In October 2020, rapid prenatal exome sequencing (pES) was introduced into routine National Health Service (NHS) care in England, requiring the coordination of care from specialist genetics, fetal medicine (FM) and laboratory services. This mixed methods study explored the experiences of professionals involved in delivering the pES service during the first 2 years of its delivery in the NHS.

Assessing the barriers and enablers to the implementation of the diagnostic radiographer musculoskeletal X-ray reporting service within the NHS in England: a systematic literature review

BMC Health Services Research 23(1270), 2023

Introduction: The United Kingdom (UK) government's healthcare policy in the early 1990s paved the way adoption of the skills mix

development and implementation of diagnostic radiographers' X-ray reporting service. Current clinical practice within the public UK healthcare system reflects the same pressures of increased demand in patient imaging and limited capacity of the reporting workforce (radiographers and radiologists) as in the 1990s. This study aimed to identify, define and assess the longitudinal macro, meso, and micro barriers and enablers to the implementation of the diagnostic radiographer musculoskeletal X-ray reporting service in the National Healthcare System (NHS) in England.

Supervision

Exploring UK sonographers' views on the use of professional supervision in clinical practice - Stage one findings of a mixed method study

Full text available with NHS OpenAthens account*
Radiography 30(1), 2024

Introduction: Professional Supervision has been described across multiple professional groups, however to date, minimal research has been conducted exploring the use of professional supervision within the United Kingdom (UK) sonographer workforce. Method(s): An online self-administered survey was conducted to explore UK sonographers views on the use of professional supervision in practice. The survey was open to sonographers, consultant or clinical specialist sonographers, ultrasound managers and professional body officers.

Technology

Can artificial intelligence replace biochemists? A study comparing interpretation of thyroid function test results by ChatGPT and Google Bard to practising biochemists

Abstract only*
Annals of Clinical Biochemistry 61(2), 2024

BACKGROUND: Public awareness of artificial intelligence (AI) is

increasing and this novel technology is being used for a range of everyday tasks and more specialist clinical applications. On a background of increasing waits for GP appointments alongside patient access to laboratory test results through the NHS app, this study aimed to assess the accuracy and safety of two AI tools, ChatGPT and Google Bard, in providing interpretation of thyroid function test results as if posed by laboratory scientists or patients.

Embedding new technology into clinical ultrasound practice: Is role extension for sonographers the key to improving patient pathways?

Ultrasound 31(2), 2023

Introduction: MicroUS is a new imaging technique that may have potential to reliably monitor prostate disease and therefore release capacity in MRI departments. Firstly, however, it is essential to identify which healthcare staff may be suitable to learn to use this modality. Based on previous evidence, UK sonographers may be well placed to harness this resource.

Topic: Currently, there is sparse evidence on the performance of MicroUS for monitoring prostate disease but early findings are encouraging. Although its uptake is increasing, it is believed that only two sites in the UK have MicroUS systems and only one of those uses just sonographers to undertake and interpret this new imaging technique.

Upskilling

Evidence of expert clinical practice among nuclear medicine non-medical staff: a scoping review Abstract only*

Nuclear medicine communications, 44(3), 2023

OBJECTIVE: This scoping review concerns expert clinical practice (ECP) by nuclear medicine practitioners (NMP), encompassing radiographers, technologists and nurses. ECP is typically demonstrated by clinical skills with higher levels of

autonomy and responsibility traditionally fulfilled by physicians. The Advanced Clinical Practice (ACP) framework by Health Education England (2017) specifies ECP as one aspect of advanced role progression. This scoping review aims to identify and categorise the extent and type of the existing NMP ECP evidence to support the establishment of Nuclear Medicine ACP.

Embedding new technology into clinical ultrasound practice: Is role extension for sonographers the key to improving patient pathways? Abstract only*

Ultrasound (Leeds, England), 31(2), 2023

Introduction: MicroUS is a new imaging technique that may have potential to reliably monitor prostate disease and therefore release capacity in MRI departments. Firstly, however, it is essential to identify which healthcare staff may be suitable to learn to use this modality. Based on previous evidence, UK sonographers may be well placed to harness this resource.

Should midwives learn to scan for presentation? Findings from a large survey of midwives in the UK Abstract only*

British Journal of Midwifery, 27(5), 2019

Background Undiagnosed breech presentation in labour is associated with fetal morbidity and mortality, and may cause significant maternal anxiety. With increasing availability of scan machines, ultrasound is now widely used in UK maternity settings. Bedside presentation scans are usually undertaken by junior doctors, often leading to delays and frustration among staff and patients.

Workforce

A national survey of the radiotherapy dosimetrist workforce in the UK

The British journal of radiology, 95, 2022

OBJECTIVES: To undertake a national survey of the Radiotherapy Dosimetrist workforce within the UK; examining different attributes and experiences, comparing results with published evidence within the literature.

Report of the 2020 British Nuclear Medicine Society survey of nuclear medicine equipment, workforce and workload Abstract only*

Nuclear medicine communications, 43(6), 2022

The British Nuclear Medicine Society (BNMS) survey represents the only resource that brings together detailed information on equipment, workforce and workload from the practice of nuclear medicine in the UK. This article is a report of the most recent BNMS survey which was collected during 2019 and 2020.

Current pressure on the UK imaging workforce deters imaging research in the NHS and requires urgent attention Abstract only*

Clinical radiology, 77(12), 2022

Medical imaging is a multidisciplinary specialty, combining clinical expertise from medical physics, radiography, and radiology, and plays a key role in patient care. Research is vital to ensure the care delivered to patients is evidence-based, and is a core component of clinical governance; however, there are pressures on the imaging workforce, which are significantly impeding imaging research. This commentary presents a research gap analysis pertaining to the multidisciplinary imaging workforce on behalf of the National Institute for Health Research (NIHR) Imaging Workforce Group. Data were summarised from membership surveys of the Royal College of Radiologists, Society and College of Radiographers, and Institute of Physics

and Engineering in Medicine; national reports; and feedback from NIHR Clinical Research Network Imaging Champions meeting in 2020/2021.

The role of radiation protection societies in tackling the skills shortage and development of young professionals and researchers Abstract only*

Journal of radiological protection : official journal of the Society for Radiological Protection, 41(3), 2021

This paper presents a framework highlighting three core objectives that need to be met to resolve the skills gap. A review of the existing initiatives being undertaken by the Society of Radiological Protection to meet these objectives is included, identifying both areas of good practice and areas for further work and development.

Workforce planning

Analysis and assessment of biomedical scientists' needs for clinical laboratory: activity-based management as an evaluation methodology

Frontiers in Bioengineering and Biotechnology 13, 2025

Introduction: Healthcare systems have to protect citizens' health by developing models combining concepts of efficiency, effectiveness and quality of care. The post-Covid-19 pandemic context has highlighted the relevance of efficiently managing and allocating human resources. In this scenario, the analysis and calculation of personnel needs take on strategic importance. The project aims to suggest a methodology to define the needs of Biomedical Scientists. The goal is to create a standard model adaptable to different contexts., Methods: This project, developed in cooperation with the Italian Society of Clinical Biochemistry and Clinical Molecular Biology, has created a new format following the "Activity Based Management" approach. It is characterized by continuous improvements, based on analysis of

processes, broken down into sub-processes and activities. After the phase of format development, a phase of application to different contexts, such as biochemistry and the hematology sectors, followed.

Radiographer reporting: A literature review to support cancer workforce planning in England

Radiography, 25(2), 2019

OBJECTIVE: Clinical Imaging contributes to screening, diagnosis, planning and monitoring of treatment and surveillance in cancer care. This literature review summarises evidence about radiographer reporting to help imaging service providers respond to Health Education England's 2017 Cancer Workforce Plan project to expand radiographer reporting in clinical service provision.

Competency Frameworks

The CanMEDS Competency Framework in laboratory medicine: a phenomenographic study exploring how professional roles are applied outside the clinical environment

Canadian Medical Education Journal 19(15), 2024

Background: The CanMEDS Competency Framework is an internationally recognized model used to outline the proficiencies of a physician. It has predominantly been studied in clinical environments but not all medical specialties take part in direct patient contact. In laboratory medicine, the role of the physician is to promote and enhance patient diagnostics by managing and overseeing the functions of a diagnostic laboratory.

Standards for the education, training and preceptorship of reporting practitioners in adult chest X-ray

The Royal College of Radiologists, 2023

Clinical imaging services play a pivotal role in the diagnosis, treatment and monitoring of various disease processes and injuries. Patients are referred to imaging services for assistance in both diagnosis and deciding on the best subsequent management of a patient's condition.

The Main Career Levels in Healthcare Science

Academy for Healthcare Sciences

Education and Career Framework (ECF) (fourth edition)

The College of Radiographers, 2022

Providing guidance for the education and career development of the radiography profession

Curriculum Library

National School of Healthcare Science

Welcome to the National School of Healthcare Science's Curriculum Library. The Library will contain the current curriculum for all of the National School of Healthcare Science programmes.