IPEM's Manifesto for the Future of Medical Physics and Clinical Engineering

2024 Government

IPEM
Institute of Physics and Engineering in Medicine

About IPEM

IPEM is a charity and professional body with a mission to improve health through Physics and Engineering in Medicine. Our vision is one in which professionalism drives improvements in diagnosis, treatment and care, transforming the lives of patients. Our members, the professional community of medical physicists, clinical and biomedical engineers and clinical technologists working in hospitals, academia and industry around the world are the people who deliver this for the NHS and more widely.

Our Mission

Improving health through Physics and Engineering in Medicine

Our Vision

Developing the professional, improving healthcare, transforming lives together

Our Values

Trusted
The leading voice in improving health through physics and engineering

Inclusive
Enabling a diverse and inclusive professional community

Progressive – Delivering innovative practice development for the public good.

IPEM calls on the next Government to:

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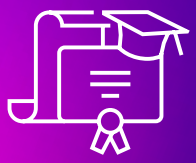
1. Address the medical physics and clinical engineering workforce crisis



2. Introduce statutory registration for Clinical Technologists

3. Create the capacity for UK generation of medical radionuclides

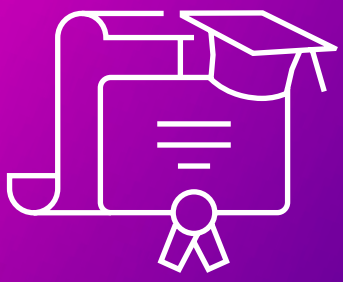
4. Ensure AI is deployed in the interests of patients

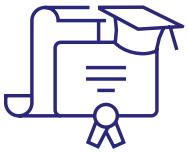
5. Ensure Environmental Sustainability for Future Generations by Investing in the Long Term

IPEM calls on the next Government to:

1.

Address the workforce crisis in Medical Physics and Clinical Engineering by investing in more trained MPCE staff and more training places, including wider access to apprenticeships and improving the provision of education in STEM subjects, including tackling the chronic shortage of physics teachers in UK secondary schools.





Addressing the Workforce Challenge

It is hugely disappointing there was no specific mention of the Medical Physics and Clinical Engineering (MPCE) workforce in the NHS Long Term Workforce Plan, other than a pledge to increase training places for all Healthcare Scientists by 13% in five years' time. The reality though, is this equates to only around 15 additional places a year for MPCE by 2025 and an additional 33 per year from 2028, woefully far short of the 450 MPCE staff posts currently sitting vacant, and those vacancies will likely have increased further by 2028.

Recommended staffing models in fact show the MPCE workforce actually requires at least 900 additional staff to come from additional training opportunities, which will be impossible to achieve by the meagre increase of training places pledged per year. At such a rate it would take close to 30 years to reach the required staffing levels.

IPEM's official workforce statement, published in 2023, showed that, across all MPCE specialisms surveyed in recent years, there is an average 10% vacancy rate, ranging from 6-22% across the specialisms.

The professions we represent are facing significant recruitment and retention issues, with an ageing workforce. In some MPCE professions, the number of staff due to retire within the next 15 years is over 30%.

At the same time, of the specialisms that do have a regular intake of trainees, IPEM data has shown the number of trainees entering the workforce is not sufficient to maintain it.

In 2020, the UK Government launched the Health and Care Worker Visa to incentivise recruitment from overseas to improve the national shortage of healthcare staff. Overseas workers applying for UK occupations listed on the National Shortage Occupation List (NSOL) are subject to broader eligibility criteria to incentivise recruitment to the UK. Medical physicists and technologists are included in both the NSOL and the list of eligible occupations to apply for the Health and Care Worker Visa, meaning that they can apply to work in the UK more easily than before.

However, despite clinical engineers also being listed on the NSOL, they are not eligible for the Health and Care Worker Visa, even though they perform an essential, complex, highly skilled and specialised role, working with the latest cutting edge technology and require specialist skills and training.

These professionals need greater recognition and should be part of the senior management in hospitals as a matter of course. With the NHS increasingly investing in new technologies, such as AI, technical and scientific involvement, at a senior level, is essential to deliver a safe, high quality, value for money service.

To address these issues, the next Government must:

- Provide £8 million annually over the lifetime of the next Parliament to Trusts to increase their staffing and training capacity and boost retention.
- Widen access to apprenticeships and improve the provision of education in STEM subjects, including tackling the chronic shortage of physics teachers in UK secondary schools.
- Use all available training routes to train as many new staff as possible, including apprenticeships.
- Use specific “clinical scientists” and “clinical technologist” titles on the NSOL.
- Add Clinical Engineers as an eligible occupation on the Health and Care Worker Visa.
- Work with NHS England and the devolved administrations to ensure that Clinical Engineers and other registered professionals in medical physics are included in the senior management decision making processes of every NHS Trust, especially in the regulation of medical devices.

IPEM calls on the next Government to:

2.

Introduce regulations to move the registration of Clinical Technologists onto a statutory footing to regulate them in the same was as other professionals such as Radiographers, providing greater public reassurance, giving the NHS more flexibility in the use of its workforce and improving patient care.

Assuring the Safe Practice of Clinical Technologists through Statutory Registration

Clinical Technologists are highly skilled, highly trained professionals who work in a wide range of essential services, including nuclear medicine, radiotherapy, bioengineering, dialysis and MRI and CT scanning, among others. They work with hazardous substances and highly complex, potentially dangerous items of equipment and are entrusted and relied upon to keep their patients, colleagues and the public safe.

Yet despite their patient facing roles, clinical technologists are currently subject only to voluntary registration via the Register of Clinical Technologists (RCT), which is run by a partnership of three professional bodies, the Institute of Physics and Engineering in Medicine (IPEM), the Association of Renal Technologists (ART) and the Institute of Healthcare Engineering and Estates Management (IHEEM). The RCT has been accredited by the Professional Standards Authority (PSA) under its Accredited Registers programme since September 2015.

However, we believe the RCT register only includes approximately 50% of current practitioners. This means that half of the UK's clinical technologists are therefore able to practice unregistered, even though their work can involve serious risk to patient safety and wellbeing, for example through the use of radiation in diagnosis and treatment; and can continue to practice even if removed from the voluntary register or sanctioned by their employer. We believe they should be subject to statutory registration for the protection of the public, similar to other highly skilled practitioners, including doctors, clinical scientists and Radiographers, and to give the NHS more flexibility and capacity in a crisis.

Clinical technologists in Nuclear Medicine and Radiographers in Nuclear Medicine essentially do the same job, with very few exceptions, they compete for the same posts. However, Nuclear Medicine technologists, under the current regulatory regime, are not legally able to perform certain functions that Radiographers do as they are not statutorily registered. Statutory registration would therefore enable greater flexibility in the workforce to cover staff shortages or absences, a point highlighted by the Covid pandemic.

The primary legislation is already in place to introduce statutory registration of Clinical Technologists.

To address these issues, the next Government must:

- Discuss any issues surrounding statutory registration, such as liability for clinical errors, with relevant stakeholders such as IPEM and the HCPC, to find solutions.
- Introduce regulations to introduce the statutory registration of Clinical Technologists.

IPEM calls on the next Government to:

3.

Create the capacity for the UK to generate its own medical radioisotopes for domestic use and export, by backing the Advanced Radioisotope Technology for Health Utility Reactor (ARTHUR) project and working in partnership with the Welsh Government to deliver this.

Creating Self-sufficiency in Radioisotope Generation

Medical radioisotopes are used in a branch of medicine that employs radiation to provide diagnostics and treatment. Diagnostic procedures using radioisotopes are now routine, identifying cancers and illnesses such as heart disease earlier to improve outcomes for patients and save lives. When used for diagnostics in this way, the radiation is detected by a scanner to produce an image that can be used to track disease progression, to provide predictive information about the likely success of various therapy options and to assess changes since treatment.

When used for treatment, molecular radiotherapy using radioisotopes delivers radiation to malignant tissue, which then weakens or destroys cancerous cells. Radioisotopes can also be used to sterilise single-use medical equipment such as syringes and surgical gloves and can be used to sterilise a range of heat-sensitive items such as powders, ointments and solutions, as well as biological preparations such as bone, nerve and skin to be used in tissue grafts.

Despite their importance, the UK now depends heavily on imports for key radioisotopes, many of which are supplied by air from South Africa and Europe. Issues with sourcing radioisotopes from overseas, such as technical problems with ageing reactors or geopolitical factors, can delay or even prevent the diagnosis and treatment of cancers, creating additional pressure on cancer waiting lists.

The lack of availability of radioisotopes is arising because many of the reactors that produce this material globally will be decommissioned within the next decade, many of them by 2030. For the benefit of patients in the UK, it is therefore vital that we have the ability to generate medical radionuclides in this country, which will also strengthen the global supply chain. Medical radioisotopes can also have very short half-lives, meaning they have to be delivered shortly after production and making them vulnerable to supply chain disruption.

The Advanced Radioisotope Technology for Health Utility Reactor (ARTHUR), which is proposed for North West Wales, would help to address these issues. The Welsh Government has previously indicated that it is willing to invest in the project, but it will also need the full support of the UK Government, both in terms of investment and the regulatory landscape. Trade unions have expressed their support for the project, which would bring a wide range of jobs, including highly skilled occupations, to the area, such as research scientists, engineers, drivers, operators, and production, technical and office staff. If work on this proceeds immediately after the election, the reactor could be in commercial operation early in the next decade.

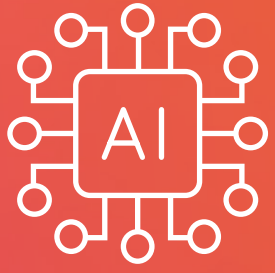
To address these issues, the next Government must:

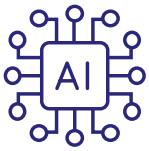
- Commit to supporting the ARTHUR project;
- Work in partnership with the Welsh Government and private sector to bring the project to fruition as soon as possible.

IPEM calls on the next Government to:

4.

Ensure AI is deployed in the interests of patients and led by healthcare professionals, with AI-specific standards to ensure safe, effective and ethical development and clinical use, and investment to develop and embed next generation digital skills.





Embracing the Power of Artificial Intelligence

AI has the potential to be an enabler of workflow productivity and innovative technologies, but is a step into the regulatory unknown. Digital technologies have the potential to improve rate and efficiency of research and development, reduce costs and reduce workload, particularly through easing administrative burden and accelerating analysis.

We must ensure the healthcare science community – at all career stages – has the skills to keep up with digital, technological and scientific change. Skills to invent, innovate, adopt and transform are the essence of science and engineering, but formal procedures must be broadened to embrace change. The extensive skills held by medical physicists and clinical engineers in this field need to be used and shared with the wider healthcare community, for instance in the acceptance testing, clinical commissioning and ongoing quality assurance of new AI software. This is also essential to ensure the ethical management of AI and, indeed, other rapidly developing technologies.

The key challenges here are ensuring that the existing workforce has the skills to fully embrace complex digital systems, and that training programmes prepare the scientists, technologists and engineers of the future without compromising their core learning. Digital skills are in high demand in almost all areas, so healthcare sciences must be promoted effectively to attract and retain talent.

In the same way that 'safety by design' has been adopted as an industry standard for other medical devices, standards for the safe, ethical and effective design and delivery of AI and machine learning must be agreed. This is particularly critical to healthcare, which holds some of the most precious, personal, and potentially exploitable data. For the workforce, it is important to establish clear lines of responsibility. Dedicated staff, such as Health Informatics Clinical Scientists or Clinical and Scientific Computing Clinical Scientists, must be involved in ensuring the safety of implemented AI.

We must act quickly to agree and design regulatory and ethical requirements and secure a seat at the table for healthcare scientists in the regional, national and international discussions that will take place to create frameworks for current and future AI technologies.

To address these issues, the next Government must:

- Invest in training the current and future generation of healthcare scientists in next generation digital skills to enable them to embrace the opportunities of AI and other emerging technologies.
- Effectively promote healthcare science as a career at the cutting edge of technological advancement.
- Review the current legislative and regulatory framework and bring in effective regulation for the governance of AI going forward.
- Facilitate discussions, with a seat for the healthcare science community across healthcare, academia and industry, on how we ensure the safe, ethical and effective design and delivery of AI.

IPEM calls on the next Government to:

5.

Promote environmental sustainability in healthcare by supporting Greener NHS, and other initiatives across the UK that promote the transition to a net zero NHS, without compromising patient care or an already overstretched workforce. Use government policies to encourage all actors in this field (including equipment manufacturers, the academic sector, and the private healthcare sector) to move meaningfully towards sustainability targets consistent with the UK Climate Change Act, and the tenets of Greener NHS.

Invest for the long term, especially in significant life saving equipment such as linear accelerators, MRI scanners and other items, to reduce the carbon footprint of replacing them avoidably early, and in the skilled professionals that can operate them safely and efficiently.

Ensuring Environmental Sustainability for Future Generations by Investing in the Long Term

To meet emissions targets we need to drastically reduce our emissions across all sectors and reduce environmental impact in other ways. The health and care system in England is responsible for an estimated 5% of the country's carbon footprint. The 'Greener NHS' strategy sets out an ambitious set of targets but currently lacks detail on how these reductions will be achieved across the different disciplines and departments that make up the NHS, and is struggling to engage NHS staff in sufficient quantities and in meaningful ways. Modern science and technologies can be a very resource-intensive process, (e.g., cell culture and devices), and this trend may continue as we pursue faster, higher resolution, more precise and more accurate diagnoses and therapies.

The NHS has committed to reduce its carbon footprint in a push to become the world's first net zero national health service. The ambitious targets include a drive to reach net zero by 2040 for emissions the NHS controls directly, and 2045 for those it influences. However, long term investment and equipment lifecycles in the NHS are a key impediment to cutting emissions, and a financial burden. Acute care is responsible for a large proportion of NHS emissions, with medicines, medical equipment and supply chain some of the biggest producers.

Medical equipment manufacturers are beginning to engage with the requirements of "Greener NHS" and must be incentivised to do this.

It is essential that reduction of emissions does not negatively impact patient safety or care, nor compromise an already stretched workforce. The scale of the challenge will require a wide range of skills and experiences, across disciplines.

To address these issues, the next Government must:

- Collaborate with the NHS to set out clearly the steps needed to reduce its carbon footprint to net zero and work with industry and academia on product design and lifecycle, and the development of new, low carbon technologies.
- Invest for the long term, especially in significant life saving equipment such as linear accelerators to reduce the carbon footprint of replacing them avoidably early, and in the skilled professionals that can operate them safely and efficiently.
- Invest in training current and future medical physicists and clinical engineers enabling them to identify, develop, commission, test and deploy low carbon solutions without compromising patient care or further stretching the wider workforce.
- Ensure that regulators are aware of and fully engaged with the need to optimise the sustainability of their work as part of their core mission.
- Actively incentivise the healthcare industry as a whole to meet the NHS net zero targets (or equivalent targets for different sectors of the industry).
- Ensure that auditing is in place throughout the industry to ensure that targets are met, and problems are highlighted in a timely fashion.

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