NHS Big Conversation IPEM Response

Q1. What does your organisation want to see included in the 10-Year Health Plan and why?

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, 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. They undertake statutory duties in cancer and diagnostic pathways.

IPEM works in partnership with a wide range of other organisations in the fields of healthcare, science, technology and engineering.

IPEM is the main professional body representing the specific group of healthcare scientists working in Medical Physics and Clinical Engineering (MPCE), who represent around 1% of NHS staff but directly contribute to nearly half of all diagnoses and treatments.

Healthcare Science is at the forefront of innovation across the NHS and also the academic and business sectors that are key to supporting the NHS through their research and development. Medical Physicists and Clinical Engineers are essential to developing, implementing and operating both new and existing technologies, from Linear Accelerators, to patient worn monitors to cutting edge AI enabled MRI scanners, and their role should be properly recognised and their involvement in the development of a new NHS embraced.

It is essential that the Plan includes Medical Physics and Clinical Engineering specifically and does not subsume it within the much more general Healthcare Science, as they were in the NHS Long Term Workforce Plan, given the significance of their impact on patient care and NHS efficiency, out of all proportion to the size of the workforce. Parliamentary Questions revealed that the previous Government did not

have a clear picture of the state of the MPCE workforce, nor a vision for its future (WPQs 19087, 19089, 19092, 19093, 19095).

It is essential that the Plan identifies how we have the right staff in the right place at the right time. CQC have identified the chronic staff shortages in medical physics MPEs, saying:

"A further concern from our work continues to relate to the shortages of medical physics experts (MPEs). We recognise the chronic shortages in the medical physics workforce and the need for a solution to increase numbers of MPEs across the country. We believe there is not enough emphasis on the importance of the medical physics expert and the physics workforce generally, and we also find that MPE workforce requirements are not factored into the procurement business cases for new equipment. Scientific staff need appropriate time and resources to quality assure equipment and fulfil all the duties under the regulations. But it is frequently noted that they have had to take on more work with limited or no increase in the workforce capacity. (see IR(ME)R annual report 2023/24 - Care Quality Commission

It is important that different specialisms are recognised and their individual staffing needs analysed.

Increasing the number of MPCE staff would significantly contribute to reducing waiting times and waiting lists.

It is also important that professionals are properly regulated and IPEM would like to see the statutory registration of Clinical Technologists. 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).

Q2. What does your organisation see as the biggest challenges and enablers to move more care from hospitals to communities?

The MPCE workforce is vital to supporting patient care. Some areas that they work in, e.g. Radiotherapy, inevitably require large centres. In addition, machines such as MRI scanners are large and expensive pieces of equipment and have particular requirements around safety, e.g. avoidance of metallic objects in the room, which require dedicated trained personnel. Medical Physicists and Clinical Engineers are a key part in implementing and operating these. Linear accelerators (Linacs), for example, require engineers to support them and a critical mass of staff is required to provide

cover during extended service hours. Single linac services would be too expensive or unsafe to run. Additional community sites require additional staff to support them but this has not always been forthcoming. It is more cost effective to support large centres than small and this inevitable cost needs to be recognised.

Clinical Engineers will be an important work force in the selection, evaluation and maintenance of the technology that will go into people's homes. Currently this workforce provide assurance of all medical devices within a Trust, however, as we move care from hospitals to communities we will have to rely on this workforce to expand and adapt their support.

It is vitally important that we have enough of these properly trained professionals to ensure that patient safety is improved and services are properly maintained. This is particularly urgent as there are currently numerous opportunities to move patient care to more local settings, some of which are already in progress. For example, the expansion of wearable cardiac monitors has had a profound impact on the quality of patient care, developed with the expertise of the MPCE workforce. Similar monitoring, rehabilitation and even treatment equipment is increasingly being used and needs Medical Physicists and Clinical Engineers to support it. The technology needed is there, but for it to work within the healthcare system, we need to consider the end users. It is important to bring patients and Healthcare Scientists into the conversation and the design of how it needs to work. We also need to consider the usability and human factors of such systems to ensure that we are minimising risks, and not excluding people with accessibility issues.

There are also increased opportunities for offsite working for staff, reducing travel times and thus, the NHS carbon footprint, and freeing up valuable workplace accommodation.

Artificial Intelligence and big data analysis provide significant opportunities for population health, diagnostic and treatment programme transformation. For example, there are multiple AI-based technologies to support diagnostic imaging which significantly increase MRI scanning capacity or reduce staff workload in interpretation of diagnostic images. Other technologies analyse population data to provide targeted diagnosis of serious conditions, such as increasing early cancer diagnosis rates. Medical Physics and Clinical Engineering professionals are highly educated and trained in mathematical techniques, risk-benefit analysis, optimisation techniques and regulatory compliance and should be at the forefront of deployment of this technology transformation programme.

Apps are increasingly popular among patients and are often developed in partnership with industry and academia. For example, there are now AI enabled apps for detecting skin cancer. Safeguarded funding for academic research and tech start ups would be a

key enabler of research and development of new apps. Medical Physicists and Clinical Engineers will be required for quality assurance and implementation of these technologies, but they offer the potential for significant patient benefit. Many of these apps are being developed by tech start ups and Clinical Engineers are supporting the development of such local start ups up and down the country. They provide regulatory support, and help developers understand how they can deploy their solutions in the NHS system.

There is plenty of evidence from patient surveys that the public want to be treated closer to home, but do not want to have to move from place to place for their care. They would prefer to get to know their care team and this needs to be borne in mind.

In order to move care from hospital to patients' communities or homes, there is a need for a universal care record that can be accessed freely by GPs, hospitals and clinics. Apart from the current IT barriers to this, with different organisations using different systems, a barrier that could be easily removed would be the implementation of a national NHS information governance agreement, compulsory for all delivering patient care.

This data could also be used better, with the involvement of Medical Physicists, to use, for example, a CT scan for cancer diagnosis, or to identify osteoarthritis. Additional information from diagnostic imaging could be used to improve population health e.g. taking CT scan data to detect vertebral fractures, sarcopenia, body composition – fat levels and nutrition. Data on referral reasons and outcome could be used to identify limited impact diagnostic tests or to identify at risk patients.

Q3. What does your organisation see as the biggest challenges and enablers to making better use of technology in health and care?

In order to move care from hospital to patients' communities or homes, there is a need for a universal care record that can be accessed freely by GPs, hospitals and clinics. Apart from the current IT barriers to this, with different organisations using different systems, a barrier that could be easily removed would be the implementation of a national NHS information governance agreement – across the UK - compulsory for all delivering patient care.

New technology can offer significant benefits for patient care. For example, AI is now enabling the NHS to provide more targeted screening for certain cancers. Genomics, developed by healthcare scientists, has been key to this. This technology however, requires a sufficient number of Medical Physicist and Clinical Engineers to develop, evaluate and implement new technology safely, effectively and efficiently.

Research and development require funding and there is a current barrier to this. Supporting academic research and industrial development of new technology, including through support for tech start ups, would pay for itself in the long term through reducing NHS costs and reducing waiting times. Support for scientists to innovate especially funding for R&D and career development needs to be improved.

The emergence of AI and other new technologies needs to be accompanied by proper regulation that is robust, yet not constraining. IPEM has called for this in our recent Manifesto for the Future of Medical Physics and Clinical Engineering (ipem-manifesto-for-the-future-of-mpce.pdf) The Government should bring together those who develop, implement and operate these systems to develop suitable regulation. Medical Physicists and Clinical Engineers are essential players in this. For example, the accuracy of AI tools to detect and measure lung nodules in CT lung cancer screening. Medical physicists can ensure the scanning protocols ensure the metrology is as accurate as it can be. IPEM would welcome the opportunity to represent our sector and be involved in such discussions with Government.

New technologies also come with inherent risk. The Government should support the NHS to manage and, indeed, cover this risk. Similar assurances of Government backing would reassure industry in developing new technologies. Equally, the NHS would benefit from great Government support for clinical trials, without which new technologies cannot be safely implemented.

A full long term funding settlement is also required for regulators to ensure that they do not become swamped as technologies emerge and develop. For example, the funding of the MRHA is vital. New technologies require robust but appropriate regulation that ensures safety whilst not stifling innovation. IPEM would be welcome to support this regulatory regime.

Medical Physicists and Clinical Engineers are a vital and unique professional group in the development of new technologies. They are involved in the research and

development of these technologies, but also in their safe, effective and efficient procurement and use. These scientific piece of equipment need scientists.

Q4. What does your organisation see as the biggest challenges and enablers to spotting illnesses earlier and tackling the causes of ill health?

IPEM welcomes the Government announcement of significant investment in new scanners and radiotherapy machines. However, as IPEM set out in our Manifesto for the Future of Medical Physics and Clinical Engineering ipem-manifesto-for-the-future-of-mpce.pdf , this needs to be implemented for the long term. This will ensure that the NHS has the latest, most effective equipment and reduce the need to replace it regularly. This will also reduce the NHS carbon footprint in replacing large pieces of equipment.

Medical Physicists and Clinical Engineers, are the specialist experts in this regard and should be involved at all stages of procurement.

It would be advantageous to develop Regional NHS Science and Technology Services to co-ordinate services across local areas. This is needed as specialists may need to cover more than one employer.

Q5. Please use this box to share specific policy ideas for change. Please include how you would prioritise these and what timeframe you would expect to see this delivered in, for example:

- Quick to do, that is in the next year or so
- In the middle, that is in the next 2 to 5 years
- Long term change, that will take more than 5 years

IPEM would welcome the opportunity to work with the Government to develop its plans.

Across all timescales, the most pressing action that can be taken is addressing workforce shortages in Medical Physics and Clinical Engineering.

Recommended staffing models show the MPCE workforce 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 in the most recent NHS Workforce Plan. 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.

All routes into the profession should be used, including an increase in apprenticeship numbers.

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 Immigration Salary List (ISL) are subject to broader eligibility criteria to incentivise recruitment to the UK. Medical physicists and technologists are included in both the ISL 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 ISL, 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.

Medical Physicists and Clinical Engineers are a unique and highly specialised staff group, that are essential to the safe and effective running of life saving NHS services. The shortage of these professionals needs to be addressed urgently to ensure safe patient care and save money in the long term.

A quick action would be the expansion of national trials and verification programmes for new technologies in the next year or so. The output of the programmes should be a government-backed database of verified technologies that can be deployed across the NHS. Medical Physicists and Clinical Engineers should be involved in these programmes.

In the next year or so, regulations should be introduced to move the registration of Clinical Technologists onto a statutory basis. These professionals often 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. There are clear patient safety and assurance arguments for their statutory registration.

The implementation of a universal NHS information governance agreement – across the whole UK - could achieved within the next 2-5 years. This would enable greater collaboration between services.

IPEM welcomes the Government's promised investment in capital equipment, such as new scanners and radiotherapy equipment. However, long term investment and equipment lifecycles in the NHS are both a financial burden and a key impediment to cutting emissions. Medical Physicists and Clinical Engineers, not only from the NHS, but also in industry and academia, should be involved at each and every stage of procurement to ensure that the latest, most effective and efficient equipment is procured. Rushing this process could prove more expensive in the long term, with the potential for procuring equipment quickly which may have a shorter lifespan than necessary. A proper, robust process, would take 2-5 years, but should not be rushed.

A regulatory framework for AI in the NHS could also be implemented within the next 2-5 years. Medical Physicists and Clinical Engineers are essential to this and IPEM would be pleased to be involved in these discussion.

In the long term, support should be given for a facility to enable the UK generation of medical radionuclides. 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. Indeed, a recent shutdown in mid-2024 led to a severe limitation on radioisotopes for nuclear medicine scans, to the detriment of patient care.

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.