

The image features a large, stylized graphic composed of two thick, magenta lines. One line starts at the top left and extends diagonally towards the bottom right. The second line starts at the top left, extends diagonally towards the bottom right, then turns upwards and to the right to form a peak, before extending diagonally towards the bottom right. This graphic is positioned in the upper half of the page. In the top right corner, the letters 'ABHI' are written in a bold, magenta, sans-serif font.

ABHI

ABHI AT 30
**THREE DECADES OF CHAMPIONING
HEALTHTECH FOR LIFE**

www.abhi.org.uk

Contents

The Pursuit of Population Health	4
The Future is Already Here – It’s Just Not Very Evenly Distributed	5
Together we are Stronger: Collaboration is our Golden Ticket to Sustainable Value	6
Why is Greater Manchester Becoming Such a Magnet for Innovators?	7
Navigating the Digital Landscape with Medical Research Charities	9
The Future is Bright – The Future is Digital	11
Looking to the Future: How Tech and the NHS can work as one	13
The NHS: Where We Are and Where We Need To Go	14
The Politically Vexed Question of How To Pay for Health and Social Care	15
An Academic Health Science Network (AHSN) Perspective	16
Celebrating 30 Years of Excellence For The HealthTech Industry	17
The NHS at 70: What Must Happen Next	18
The Three Major Transformations Over The Past Three Decades	19
Developing HealthTech – A Supportive Research Landscape	20
The Future of Healthcare is Data	22
AHSNS: The Key Innovation Arm of the NHS	23
Why Medical Technology Should be at the Heart of the NHS’s Long-Term Plan	24
Transforming the Future of Healthcare	25
Value: Improving Health Outcomes for as Low a Cost as Possible	26
A Reflection on the Early Days of ABHI	27
Harnessing the Power of Data	28
Reworking the Deal Between the Seller and User	29
To the Machines that go Beep	30
Turning Obstacles into Milestones: The Role of Technology in Facing Today’s Healthcare Challenges	31
Are Patients not Pushing Hard Enough to Access Innovations?	32
Academic Entrepreneurship: From Counter-Terrorism to the 21st C Thermometer	33
Shared Values and Vision: ABHI and AdvaMed’s Transatlantic Commitment to Ethics & Patient Access to MedTech Innovation	34
The Role of the Regulator in Balancing Prosperity and Protection	35
The Future for Medtech in the North of England is Very Bright Indeed	36
What Innovations Will Have the Most Impact over the Next 70 Years?	37

It is with great pleasure that I introduce to you, ABHI at 30, a collection of 30 opinion pieces from the key players in our industry, to mark three decades of ABHI.

If your business is health, 30 years is a long time.

13 Health Secretaries, sweeping reforms and varying levels of funding have led to a challenging, but dynamic environment to work in. In that time, our industry has changed significantly too, from being product based, to delivering value-based service solutions and increasingly incorporating new fields of science, utilising digital data, artificial intelligence and robotics.

From its regulatory based inception, ABHI has grown, not just in size, but in its activity and crucially, impact. A leadership team has been assembled, specialists in their respective fields, and the international business has been developed widely. We have a level of participation in policy discussions and a network that is unsurpassed by others in HealthTech. The team are expertly positioned to represent their 280 members and I am proud that ABHI's voice has never been better, louder or stronger.

Of course, ours isn't the only birthday this year. The NHS marked its 70th and a number of the articles within this book highlight the future direction of our health service, made

all the more fascinating by the recently announced 10-year plan, a new Secretary of State for Health, the emergence of Integrated Care Systems and the coming together of NHS England and NHS Improvement. There has, arguably, never been a time of more profound change.

What the UK's relationship with the rest of Europe will look like, post March 2019, remains to be seen; far be it for me to speculate. One thing I am certain of though, is this is truly the most exciting time to be involved in our industry.

I encourage you to take the time, sit back and enjoy this document. Read through the opinions. These are the voices that make our industry what it is. Let's celebrate it.



Philip Kennedy, Chair, ABHI

The Pursuit of Population Health

A new long-term funding offer for the NHS – which is both substantial and yet less than most estimates of what is needed to improve and transform care – has given the NHS a welcome opportunity to take a strategic pause and consider its priorities over the coming decade.

The King's Fund believes the NHS must now place its focus firmly on the pursuit of population health.

The King's Fund believes the NHS must now place its focus firmly on the pursuit of population health – improving health outcomes for the population as a whole, and reducing inequity in outcomes for different parts of the population. The ten-year plan being developed by the NHS must chart a course towards this goal, and rigorously assess if an initiative or programme will 'make the boat go faster' on this journey.

What might this mean in practice? First, it means rebalancing the focus of national priorities away from outputs and processes to outcomes. Services in today's NHS are measured by time – 62 day waits for cancer treatment, four hour waits in A&E, 18 week waits for consultant-led hospital care. Following the path ambulance services have laid, more effort should be made to develop clinically-relevant standards that focus on maintaining and improving the health of the population. For the accountable care networks of the future it must surely be as important to tackle the issue of 20 per cent of cancers being diagnosed in A&E departments, in addition to ensuring timely treatment following a diagnosis.

Second, it means investing in the services that lie outside of hospital. The NHS could easily spend all of the new funding on boosting capacity in hospitals in an attempt to meet the access targets of today. But wiser stewardship of these resources would involve investing heavily in prevention, public health, social care, and community services. Earlier detection and treatment of cancer is vitally important. It is no less important to invest in programmes that support the public to improve diets, exercise and wellbeing to reduce the likelihood of developing cancer.

And third, the tension between systems and institutions must be resolved. Integrated care systems are leading the way in this regard, but by the end of ten years it must be the norm for leaders of individual organisations to think 'system first' when faced with decisions over future strategy. The days when NHS away-days would be spent on plans to increase market share and repatriate profitable activity must change to focussing on how organisations can be better and more effective collaborative partners in the pursuit of population health. Easy to say, and fiendishly difficult to deliver – although systems now come together to develop joint plans through sustainability and transformation partnerships, further legislative, political, financial and regulatory changes are now needed to reflect this new emphasis on systems of care.

So, no small task. But with a guiding northern star of population health management providing some strategic clarity, a plan can be developed to ensure the next decade is the one where the NHS transformed from being a national treatment service, to a true national health service.



**Siva Anandaciva, Chief Analyst,
The King's Fund**

The Future is Already Here – It’s Just Not Very Evenly Distributed

What is possible when the computing power of machines and the clinical expertise of humans come together?

Imagine Jane, a 56-year old woman with type 2 diabetes. By using a primary care service, powered by artificial intelligence (AI), to manage her condition on a day to day basis, she can track her blood glucose, blood pressure, and other key indicators of her condition. If there’s a worrying trend in her vitals, predictive AI will send advice to her mobile phone and can alert her doctor if needed. If she’s feeling unwell, she uses the AI symptom checker to see what she needs to do. If needed, she can organise consultations over video with a general practitioner or specialist, booking in seconds and talking to her doctor without having to leave her home or place of work.

This is no “vapourware” – everything Jane can use this digital-first service for is already available or is coming out this year.

So, what does a good AI-based digital-first system for primary care look like?

Triage

Artificial intelligence is used to assess symptoms, entered by the user, and recommend the level of medical intervention that is needed. This is already in use for two million people in North Central London. Entering symptoms on the chat bot takes seconds, and the triage advice comes back instantaneously – 24/7, 365 days a year.

Fast access to a clinician when needed

Sending texts and pictures to registered doctors and nurses to get an answer within minutes is a powerful way of avoiding unnecessary appointments. When it comes to actual consultations, people need a secure way to speak to clinicians by video or phone – avoiding travel and freeing up premises costs.

Patient health profile

By enabling patients to collect, assess and benchmark their own information on their health and wellbeing, they can combine data with other health apps and get a tailored picture of their health. Instant access, 24 hours a day, 365 days a year.

What does the future hold?

The speed of technological improvement means that what is cutting-edge today will be commonplace tomorrow, and today’s approaches will fast become defunct. Or as William Gibson (who coined the term “cyberspace”) put it, “The future is already here – it’s just not very evenly distributed”. Look out for:

- AI symptom checking and differential diagnosis using genuine, auditable machine learning. Each new interaction is an opportunity to compare the results to the best medical opinion and update the AI to improve its accuracy
- AI analysis of diagnostic imaging
- Adaptive analytics allowing continuous health monitoring and preventative intervention. This will use behavioural, environmental, clinical and any genetic information that the individual consents to provide, all integrated into the AI system.

Put all this together and the potential to transform primary healthcare is tremendous. For clinicians, the ability to practice at the top of their licence becomes a reality. Most importantly, for Jane, managing her diabetes becomes far easier because she’s getting a full end-to-end health service that puts her in control of her life.



Paul Bate, Chief NHS Officer, Babylon

Together we are Stronger: Collaboration is our Golden Ticket to Sustainable Value

Try to imagine our world today without MedTech. It's not easy to do because we know it is central to the health of society today and the sustainability of healthcare tomorrow. MedTech's role in placing patients at the heart of care will only grow. It's this responsibility that gets us out of bed each workday.

I'm proud to be part of an industry that – in just a few short decades – has progressed from the equivalent of the candlestick to the lightbulb. We did not settle for current standards but instead created new solutions that filled quality and safety gaps to improve and diversify treatment options. Today, game-changing 1980s innovations, such as minimally-invasive surgery, are best-practice.

When ABHI was formed in 1988 (the same year I joined Johnson & Johnson) there were 56 million¹ UK residents. Today an additional 10 million¹ people require access to care. Testament to great strides in UK care standards, today there are more people aged 65 or above, and 6 years added onto average life expectancy.² Yet, with fewer working-age people contributing to NHS funding, a good quality of life in later years could be harder to achieve.

Society is balancing on the edge of a growing chasm between care needs and resource to deliver it.

Society is balancing on the edge of a growing chasm between care needs and resource to deliver it.

I believe our greatest strength to add value through MedTech lies in listening to what keeps health providers up at night, and translating this into insight-led solutions. It is only logical that we join forces to deliver optimally and effectively. Some of the most exciting examples of this type of collaborative synergy is delivered through the value-based solutions our industry is co-creating with UK hospitals. Combining innovative technologies and bespoke solutions is allowing us to future-proof the NHS by reducing total care costs, and improving outcomes and satisfaction for patients.

CareAdvantage is one example of this partnership approach that I've had the pleasure to be involved with. As part of Johnson & Johnson's longstanding relationship with Guy's and St. Thomas' NHS Foundation Trust in London, last year we completed a programme within the colorectal, gynaecology and upper gastrointestinal departments. Laparoscopic adoption in hysterectomy and myomectomy procedures doubled and patients recovered more quickly releasing more than 1,500 bed days.

An earlier Guy's and St Thomas' orthopaedics pilot contributed to improved patient satisfaction at a lower cost by reduced length of stay, which released a further 2,900 bed days. That's over 4,400 beds days that have been saved in collaboration with the Trust.

Results such as these exemplify our industry's ability to be at the forefront of innovative, sustainable and high-quality healthcare delivery in the UK. Through collaboration with the healthcare providers we serve and industry bodies including ABHI, our industry will remain perfectly placed to deliver care that is based on true value for patients and providers.



Michelle Brennan, Company Group Chair, Johnson & Johnson Medical Devices Companies, Europe, Middle East & Africa (EMEA) and Chair of the Board of MedTech Europe

1. Dataset: Overview of the UK population: March 2017. Office for National Statistics. Available here: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/mar2017>. Accessed: 20.07.2018.
2. Dataset: National life tables: United Kingdom. Office for National Statistics. Available here: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/datasets/nationallifetablesunitedkingdomreferencetables>. Accessed: 20.07.2018.

Why is Greater Manchester Becoming Such a Magnet for Innovators?

In July 1948 Aneurin Bevan walked into Park hospital in Manchester to launch a free healthcare service. This hospital is now called Trafford general hospital and is known as “the birthplace of the NHS”. Although much has changed over the past 70 years, what has remained a constant is the three core principles that drive the health service. Specifically, that it meets the needs of everyone, is free at the point of delivery, and is based on clinical need not the ability to pay. However, continuing to adhere to these principles for the foreseeable future against the backdrop of significant public health challenges and rising costs of health and social care requires a rapid wholesale change in how we work; not only within the health and care system itself, but also in terms of how we interact with our citizens, academia, and industry innovators.

Fast forward to today, and Greater Manchester is ushering in a new era for health and social care to tackle these challenges head-on through its health and social care devolution. A novel approach that enables us to agree and work towards shared priorities at a system level, combining all of our health and social care services and building them around the individual and the community for better, more responsive care; reshaping the system so that it is sustainable and works for everyone.

There is not much that hasn't already been written about Greater Manchester's 'devolution experiment' and having worked at the coal face for almost a year I can understand why. From the outside looking in devolution does appear to have supercharged our ability to bring about the wholesale change required to make Greater Manchester one of the best places in the world to grow up, get on and grow old.

However, it's not devolved powers alone that are enabling such a radical transformation - it's the regions approach to collaborative working.

However, it's not devolved powers alone that are enabling such a radical transformation – it's the regions approach to collaborative working.

What I have witnessed in terms of the way that health and social care organisations are embracing the devolution opportunity to work in partnership and effect real positive change is unprecedented. The fear of change that so often

grips an organisation during periods of transition simply does not exist. 'One Manchester' is not a catchy mantra that is portrayed to the outside world, it's an ethos that drives us all. While devolution is providing us with the tools that we need, it's our willingness to work transparently and in partnership that is driving success.

Excitingly, this environment is also proving a natural incubator for innovation, not only between providers and commissioners in Greater Manchester, but also researchers, citizens, academia and industry. As a believer in the concept that proven innovation injected at pace and scale into health and social care is a cornerstone to transforming the health and wellbeing of our 2.8m citizens, this is fantastic.

We are changing the game for innovation in health and social care, and this is reflected in the rich pipeline of innovation that has been created for the system through Health Innovation Manchester (HInM) – our academic health science and innovation system. Despite HInM being only one year old in October this year, we are already delivering a large and diverse portfolio of innovation projects in partnership with multinational health technology and pharmaceutical companies and SMEs. We have also worked with over 200 fledgling SMEs at varying stages of product/service development, providing access to funding and expertise to help them introduce their new and innovative products to the NHS and social care in Greater Manchester, and further afield through our links with the wider Academic Health Science Network (AHSN Network).

But why is Greater Manchester becoming such a magnet for innovators? Is it because of the digital infrastructure we are building to underpin population health and research, and enable proof of concept in a real-world setting? Is it because our approach allows us to evaluate the costs and benefits of innovations across whole care pathways outside of individual institutions, eliminating perverse financial incentives? Is it because we have a concise view of the system needs that is proactively shared with researchers and innovators? Is it because we have streamlined governance arrangements that facilitate quick decision-making with the ability to commission innovations on behalf of the entire system? Or is it our willingness to be open to collaboration with industry, exploring new business models and deploying proven innovation at pace and scale. I think it is fair to say that all of these play an equal part, and if you were to remove any one of them then the level of interest from innovators would diminish.

Obviously being the 'first mover' in the world of health and social care devolution does bring its challenges (we get to make all the mistakes that others may learn from in the future, and what we are doing is highly visible). We are asking providers, commissioners and industry innovators to work with us in a completely new way whilst at the same time affording us the patience to test and embed new processes of working. However, our industry partners can see what we are creating and with their support and that of key industry bodies such as the Association of British HealthTech Industries and their members, we have been breaking this new ground together.

Devolution is enabling the creation of virtuous cycle of partnership working that transcends organisational boundaries. With such a cohesive system bringing together the all the exceptional assets of the city region and commercial partners all working towards shared priorities, Greater Manchester is certainly on track to deliver on its ambition for the fastest possible improvement to the health and wellbeing of its 2.9 million citizens.

Could we achieve this without devolution? Probably not. But would devolution work without a no fear culture of collaboration, definitely not.



**Ben Bridgewater, Chief Executive,
Health Innovation Manchester**

Navigating the Digital Landscape with Medical Research Charities

The traditional view of medical research charities is that they fund basic scientific research. That is no longer the name of the game. Charity 2.0, as we think of them, are at the cutting edge of development, putting patients at the heart of what they do and how they spend their money.

Recent advances in technology and big data are opening up many exciting new opportunities for charities, both to accelerate research as well as to drive improvements in patient care and treatment. Each day new articles abound demonstrating where technologies such as artificial intelligence (AI) and machine learning will advance healthcare. Whilst AI often grabs the headlines, there are many data-driven technologies on the horizon, some of which are close to becoming more generally available. Examples include improved diagnostic tests as well as virtual tools and health apps which are capable of revolutionising care and transferring greater power to patients to self-manage their condition. For example, Autistica UK, the UK's leading autism charity, recently launched Molehill Mountain, an app to help autistic people understand more about their anxiety.

With the immense potential of health technologies, it is unsurprising that charities are investing significant resource to develop these innovative new tools. A recent Association of Medical Research Charities (AMRC) report revealed that charities invested £380 million between 2015 and 2016 to develop health technologies and of AMRC's over 140 members; almost 80 of them are funding research in this field.

Driving the success of many of these technologies is data, and famously AI is underpinned by algorithms which rely upon learning from vast swathes of it. The UK has a rich and unique health data source in the NHS, reflecting its cradle-to-grave service and the diversity of the UK's population. For researchers developing data-driven tools to better understand the causes of ill health and develop treatments and cures, this is an incredible resource.

Moreover, the responsible use of patient data has already helped progress our understanding of disease and ill-health in many different ways. A study funded by Kidney Research UK using data from the UK Renal Registry and hospitals found a pattern of hospitalisation amongst kidney patients that led to new recommendations for clinical practice. In cystic fibrosis (CF), a registry of patient data led to the development of essential new treatments. Data from the CF Registry is also proving an effective tool in the development of new technologies by CF Trust under a program called SmartCare CF.

What might the future hold?

It seems inevitable that technologies such as artificial intelligence will redesign healthcare with vast numbers of private organisations beginning to focus on designing AI tools for the health sector including big players: DeepMind, IBM Watson and BenevolentAI. There are also many smaller players such as the ambitious Sentrian, a start-up harbouring the ambition of developing algorithms that can predict ill-health prior to the onset of symptoms.

For healthcare delivery, the realistic wide-scale implementation of AI in the next few years will likely be in the areas of app development for diagnostic purposes and the implementation of personalised support and treatment regimes. Whilst AI may not be used widely across the NHS straight away, charities have started to take the risk of working with big date., Asthma UK, for example, is partnering in a program called myAirCoach, which is focused on developing self-management tools involving the combination of a 'smart' inhaler and app for a smart device. The inhaler will contain a number of sensors which will record how well people are taking medication as well as small changes that they may not notice. In the future, it may even be possible to embed these tools as a means of linking asthma patients with their healthcare professionals.

And they aren't the only one. Arthritis Research UK, for example, is developing an AI-based virtual assistant in conjunction with IBM for people with musculoskeletal conditions to support self-management. Additionally, Parkinson's UK and The Cure Parkinson's Trust are partnering together with AMRC supporter BenevolentAI, to develop new treatments for Parkinson's patients. This followed the charities partnering to win the inaugural Benevolent AI award, a competition run through with AMRC especially aimed to benefit medical research charities and the people they serve. The charities will now benefit from BenevolentAI platform's capabilities to reason, deduce and suggest entirely new treatments for Parkinson's patients.

While data is fundamental to developing these exciting and life enhancing innovations, many of these connected apps and tools will require improvements in the digital preparedness of the NHS, to fully realise their potential. This will require implementation of appropriate data standards as well as ensuring that data is joined up across the different areas of the NHS. By doing so we can then harness the world-leading uniqueness of the NHS dataset to both develop and maximise the potential of innovative technologies, which will benefit patients as well as ease pressures on the NHS.

A number of our member CEOs have recognised the challenges of moving into this space and recognise the need for and power of collaboration. To that end we have all signed an agreement to prioritise partnerships in this area to address unmet need and co-work to surmount potential barriers to success. There is a hunger to get things right – but by innovating responsibly.

We know that patients collect data about their health every day, we all do. Innovations in digital health tech are becoming part and parcel of what AMRC members can and should deliver – often at speed. Our challenge is ensuring we can empower our members to use data and partner with those across sectors in an ethical, safe and innovative way. It's a challenge we accept.



**Aisling Burnand, Chief Executive,
Association of Medical Research Charities**

The Future is Bright - The Future is Digital

Digital healthcare holds great potential with robotics, artificial intelligence, healthcare management tools and digital monitoring devices all offering potential solutions to health challenges. The UK is powerfully positioned to lead in the discovery and evaluation of these new approaches, but if we are to accelerate the development of new medical technology, diagnostics and digital tools then we also need to support companies in accessing this expertise.

Over the past seven years, the Department of Health and Social Care (DHSC) has invested considerable funding and resource into setting up and maintaining MedTech specific research infrastructure within the National Institute for Health Research (NIHR) to support companies with their innovation. This support can be found across the NIHR's infrastructure; most evidently through the NIHR Medtech and In vitro diagnostic Cooperatives (MICs)¹. The MICs have been set-up to work with industry to assess the need for a specific technology and to guide companies on evidence generation for clinical and cost effectiveness. Their ultimate goal is to accelerate innovation bringing new medical devices and diagnostics to the NHS faster.

The expertise of the MICs is focused on some key areas of unmet need:

- Cardiovascular
- Children and Young People
- Community Healthcare
- Device for Dignity (incontinence and assistive living)
- In-vitro Diagnostics (IVDs) across all disease areas – point of care and laboratory assays
- Neurological Disorders
- Surgical Technologies
- Trauma Management
- Traumatic Brain Injury

They form centres of excellence embedded within leading NHS hospitals or universities across the country and are geared to work with innovators in the UK and internationally.

An area where the MICs have a particular strength is how they can bring multi-disciplinary teams together. These teams can include clinicians, engineers, laboratory specialists, health economists and human factors experts. The idea is to get a broader view and assessment on the need for the technology and to get a project team in place to fast-track evidence generation.

An area where the MICs have a particular strength is how they can bring multi-disciplinary teams together.

While the MICs can support with product development and evaluation, the NIHR can also help companies to access a national network of research sites to run their study. Through its Study Support Service², the NIHR Clinical Research Network (CRN)³ can help companies to determine if their study is compatible with UK clinical practice and advise if it can be delivered successfully in the NHS. The aim is to increase a company's chances of delivering its study on time and meeting its recruitment target and it has an excellent record of doing this. In 2017-18, 88% of MedTech CRN-supported studies achieved their recruitment target to time; this in turn helped companies with keeping on track with their development and time-to-market timelines.

Another area where the NIHR has really made an impact for MedTech is in funding product development. This has been mainly via the NIHR Invention for Innovation (i4i)⁴ funding programme. As a translational funding scheme, i4i advances healthcare technologies, devices and interventions for increased patient benefit in areas of existing or emerging clinical need. NIHR i4i funds collaborative R&D projects in MedTech SMEs, universities and the NHS that have demonstrated proof-of-principle and have a clear pathway towards adoption and commercialisation. The aim is to de-risk projects, making them attractive to follow-on funders and investors. The expected i4i output is an advanced or clinically validated prototype medical device, technology or intervention.

The recent Strength and Opportunity report⁵ published by the Office for Life Sciences highlighted two areas of growth within the UK MedTech sector; these are Digital Health and Medical Imaging. The NIHR Infrastructure has considerable expertise and capabilities in both of these areas. For example, the NIHR Nottingham MindTech MIC⁶ has been working on the development of digital health solutions for mental health disorders, such as the Power Up app⁷, which allows young people to support shared decision making with their therapists about their treatment. The app was also designed through an NIHR i4i grant.

The MedTech industry has long maintained issues around evaluation of novel technologies, but the NIHR's expertise and infrastructure are helping companies overcome these hurdles. Additionally, the NIHR is working closely with the

Academic Health Science Networks (AHSNs) to provide appropriate evidence to enable adoption of new technologies into the NHS.

One of the key focus areas for the MICs is to assess early on the patient pathway for a new technology and how this differs from existing management of patients within the NHS. In adopting new technologies it is often the case there is upfront additional costs for the NHS. However, by assessing the overall patient pathway and input from clinicians it is possible to carry out a health economic analysis of the total cost-effectiveness of new technologies. This is a valuable resource for the MedTech industry and is consequently a core remit of the MICs.

For further information on the NIHR and to access the NIHR Infrastructure or expertise please contact the NIHR Office for Clinical Research Infrastructure:

nocri@nihr.ac.uk



**Mr Ravi Chana, Senior Business
Development Manager, NIHR Office for
Clinical Research Infrastructure (NOCRI)**

1. www.nihr.ac.uk/about-us/how-we-are-managed/our-structure/infrastructure/Documents/medtech-and-in-vitro-diagnostic-co-operatives.htm
2. www.nihr.ac.uk/funding-and-support/study-support-service/
3. www.nihr.ac.uk/about-us/how-we-are-managed/managing-centres/crn/
4. www.nihr.ac.uk/funding-and-support/funding-for-research-studies/funding-programmes/invention-for-innovation/
5. www.gov.uk/government/publications/bioscience-and-health-technology-database-annual-report-2017
6. www.mindtech.org.uk/
7. www.mindtech.org.uk/research/research-themes/digital-interventions/power-up

Looking to the Future: How Tech and the NHS can work as one

Where technology is concerned, it's safe to say the NHS has struggled to find its feet, at least on a national level.

The historically chequered relationship health and care have had with tech can – and must – be addressed.

Thankfully, tech has never been higher on the agenda for the health service. What does this mean for the future, and the construction of the 10-year plan for the NHS?

One thing is certain: Tech is rapidly becoming an integral part of the agenda's foundation, or at least in the rhetoric around it.

One thing is certain: Tech is rapidly becoming an integral part of the agenda's foundation, or at least in the rhetoric around it.

Better tech holds the potential to free up staff time, create more patient-centred care, improve medical outcomes, and drastically improve workforce rotas.

For example, a new app developed by Milton Keynes University Hospital NHS Foundation Trust allows patients to change and confirm appointments on a smartphone, tablet or computer, with outpatient letters emailed in real time.

However, important as it is, we should remember that focusing on technological advancement alone will not be enough.

I believe the future of health and care in England will be determined by a myriad of factors – such as adequate provision for social care, integration, and having the right workforce – which must work in tandem with tech.

There must be the ability to work easily across vocational and geographical boundaries, to plan for the health of the whole population, and put patients at the centre of their own care.

Fortunately for health and care, we are already heading in the right direction, as much of the tech currently on offer or in development helps to do this.

Secretary of State Matt Hancock made an accurate observation at his inaugural Health and Care Innovation Expo speech. This was that the grassroots culture of technological development in health and care at the local level is a cornerstone of wider adoption throughout the service.

He implored the sector to work with tech companies, and he also issued a warning to firms not aligned with the NHS's priorities – telling them that they won't be selling to the NHS if they aren't on board.

And already, at the case-by-case level, there are numerous NHS trusts working hand-in-hand with the tech sector on innovations that have had an immeasurable impact on patients and the staff who care for them.

These early signs paint a relatively optimistic picture for the future, where tech and health work as one for the benefit of patients.

But this great work must be expanded nationally if the health service is to keep providing the best care possible.

And to bring this future about, both sides will need to have a greater understanding of what the other is doing.

If NHS England and other key partners are serious about developing a plan with the service we need proper engagement with leaders and frontline staff. The plan needs to be good but it also needs buy-in.

A truly integrated system with clear pathways between NHS services and health and care, aided thoroughly by tech, is within reach – if we can come together as a wider sector.



**Niall Dickson, Chief Executive,
NHS Confederation**

The NHS: Where We Are and Where We Need To Go

With the NHS celebrating its 70th anniversary this year, we have had the opportunity to recognise its many achievements. However, with a growing and aging population, facing more complex, chronic and concurrent conditions, it now must confront its biggest challenge since its creation in 1948. As the baby boomer generation gets frailer and older, the NHS – and, its sibling service, social care – will face more pressure than ever.

In June this year, three weeks before the anniversary Theresa May and her Government made a vital step towards ensuring the NHS is up for the task. After years of austerity, our beloved health service has finally got a much-needed funding boost. Many – including the Independent Review I recently chaired for IPPR – have argued for more money, with some commentators arguing that only 4 percent per year growth (compared to 3.4 percent promised) would allow the service to maintain its existing standards.

But in reality, this is more than we could have hoped for at the start of the process. And, just as important was the Government’s commitment that this new funding would be invested in much needed reform. This is the pledge we must now focus on – as well as securing more funding for other services such as social care and public health in the upcoming spending review – if the NHS is to thrive in the 2020’s.

After all, funding alone will not unlock the potential of the NHS. We must also embrace radical reform.

After all, funding alone will not unlock the potential of the NHS. We must also embrace radical reform. This is not because politicians say so; politically motivated change has poisoned the case for reform. But, because more and better science, as well as the digital revolution, have produced novel new models of care, drugs, treatments and technologies that can ‘predict

and prevent’ where we once had to make do with ‘diagnose and treat’. In short, high-quality care is a constantly moving target: to stand still is to fall back. That’s why we need to revive reform.

Overall, the Five Year Forward View has started this journey of change. We have begun to develop a more modern healthcare system that focuses on prevention, which is more integrated and patient-centric. However, there is still a lot to be done to deliver a health and care system fit for the 21st Century. Too often we still operate a sickness service, where resources are heavily weighted in the acute sector, when we should be transitioning to a wellbeing service based on strong foundations of community health and social care.

Technology, science and innovation are our greatest allies in looking to drive these changes in our health care system, as well as the improvements in health outcomes and efficiency that we so desperately need. But, all too often we leave innovation out in the cold. With ground-breaking new digital developments such as Artificial Intelligence (AI) and treatments such as Cell and Gene Therapies fast becoming a reality, we cannot afford to do this any longer.

There has never been a better moment to embrace change for a better, healthier future for the nation. We must now seize this opportunity.



**Professor the Lord Darzi of Denham
OM KBE PC FRS, Institute of Global Health
Innovation, Imperial College London**

On the back of the Review Lord Darzi will continue to co-chair IPPR’s programme for Better Health & Care which will look to shape the health and care debate in the years to come.

The Politically Vexed Question of How To Pay for Health and Social Care

Research by the Institute for Government has identified three funding questions that the Government must answer in order to place health and social care on a firm financial footing.

- 1) How much more money is needed?
- 2) How should additional funds be raised?
- 3) How can funding be provided consistently and predictably over time?

The Government's June NHS funding announcement only partially answered the first of these questions, as it only covered NHS England, not the whole of the health budget, and did not address social care.

Critically, by failing to satisfactorily answer the second question – how additional funds should be raised – the Government risked the settlement being unsustainable. In the short term, the Government was lucky that reduced borrowing forecasts provided enough fiscal space in the Budget to pay for the NHS's 70th birthday present. However, there are still serious questions about long term funding of the health and social care system. Unless there is a clear plan on how to raise additional funds, it will have to come from cuts to other parts of public expenditure where there is little low hanging fruit left to pick.

So how should government approach the politically vexed question of how to pay for health and social care? The scale of the sums involved would be challenging for any government, but is particularly tricky for a minority government.

Our research looked at 17 past examples where governments have tackled knotty policy issues – from health and social care, to tuition fees and pensions. Based on this analysis, we believe that a parliamentary inquiry – modelled on the Parliamentary Commission on Banking Standards – offers the best chance of providing government with sufficient political cover to act.

There is already cross-party support for such an inquiry, with a letter coordinated by Sarah Wollaston MP, the chair of the Health and Social Care Committee, securing the signatures of over 100 MPs. Such an inquiry could be set up quickly. And

if it were chaired by a select committee chair, there would be the advantage that a high-profile body would be available to continue to champion recommendations beyond the life of the inquiry.

To maximise the chances if such an inquiry succeeded, it would need the support of the Prime Minister and preferably the Chancellor too. Opposition parties should be given an opportunity to comment on the chair and remit. It would need a chair who was politically savvy. And, it should undertake extensive public engagement, to improve the quality of the recommendations and build public support and awareness.

That leaves the third question – how to ensure funding is provided consistently over time? We recommend the use of an independent body. Such a body would monitor spending plans and recommend adjustments in light of changing circumstances. It would also scrutinise the Government's costing of individual health and social care spending measures.

These responsibilities could be given either to an existing body – for example the OBR – or to a new one, established specifically for the role. Either way it would need autonomy and high-quality leadership.

Answering these three questions will be difficult – the issues are highly political and the precedents are poor. But the situation is not impossible. The recommendations above represent a realistic route that this Government or any future one could use to implement a long-term and sustainable funding solution for health and social care.



**Nick Davies, Programme Director,
Institute for Government**

An Academic Health Science Network (AHSN) Perspective

I recently completed my fifth year working as the West Midlands Academic Health Science Network's (WMAHSN) Commercial Director; before that, I spent 11 years as the Chair of the industry association Medilink UK and the CEO of Medilink West Midlands. This means that I have had the pleasure of working with and alongside the ABHI for the last 16 years, witnessing its tremendous industrial advocacy and leadership for more than half its lifespan.

This gives me a somewhat unique insight into the development and delivery of the fifteen AHSNs and how they are impacting upon medical and health technology industries. In my industry association role, I worked alongside ABHI leaders and members promoting and pushing UK innovation towards the National Health Service. An NHS which according to the Wanless report (DH_066213) was considered to be in a global context a "slow and late adopter of innovation".

In 2012/13 – as a response to the Innovation Health and Wealth report (DH_131299) – AHSNs were created as an important link to both the Wanless challenge of adopting innovative technology at scale and pace and the economic growth challenge the country was facing at the time. AHSNs were the output of a collaboration process between the NHS, academia and industry, with each national and regional collaborator envisaging a differently nuanced outcome from the activity of the AHSN.

I saw a great opportunity within AHSNs for taking "time and cost" out of the innovation adoption process for industry at the same time as delivering the quality of healthcare I would expect as a potential user of the NHS. I considered this to be such a great opportunity that I decided to take a Commercial Director role within the West Midland AHSN to try to create an environment within the NHS where we could deliver on both of those opportunities.

Looking back, I would have to admit I had underestimated the scale and complexity of the task AHSNs had been set.

Looking back, I would have to admit I had underestimated the scale and complexity of the task AHSNs had been set; and over the last five years my perception of the barriers to adopting innovation has greatly changed. In my time in the NHS I have worked with some of the most innovative and entrepreneurial people I have ever met: clinical staff and managers who are open and receptive to both systems change and new technology, mirroring the drive and enthusiasm I had previously been part of in my time with industry. However, often those clinicians and managers are working under the greatest structural pressure, created by a whole series of factors not always within their control.

So, are we, as AHSNs, breaking down the barriers? I would have to say yes, but slowly because the scale of the task is so large and the window of opportunity to introduce change through innovative technologies is often so small. The evolution of Sustainability and Transformation Partnerships and Integrated Care Systems are opening up new opportunities for industry to work together with the NHS. Looking ahead our challenge as an AHSN is to work more intensively at a local and national level with industry on truly transformational services and technologies.



Tony Davis, Commercial Director, West Midlands Academic Health Science Network

Celebrating 30 Years of Excellence For The HealthTech Industry

As the ABHI celebrates 30 years, it is a pleasure to wish the organisation a happy birthday. Reaching this significant milestone is an achievement in itself. It is also a mark of the ABHI's success as an influential voice for the health technology sector in the UK, and all over the world.

The anniversary is a perfect opportunity to reflect on what NICE and ABHI have achieved together to advance health technology in the NHS, ensure it is part of the life sciences landscape and, most importantly, highlight the difference health technology can make to people's lives.

The ABHI is a highly valued partner of NICE and has had a leading part in our own health technology story. In 2009, when we first started to explore separate, bespoke evaluation for health technology and diagnostics, the ABHI was there with us, alongside colleagues from BIVDA, helping to forge these new programmes. The association provided a vital link to industry that ensured these new areas of work could identify and evaluate innovative medical devices and diagnostics; bringing clear patient benefits and offering the NHS the best value for money.

From supporting our technology appraisals on implantable cardiac devices to engaging with the development of Medtech innovation briefings, the ABHI has been a trusted and, when needed, critical friend of NICE, giving valuable insight and expertise to help us develop effective advice and guidance for the NHS.

As a core stakeholder, the association has always maintained good links with us through regular meetings to discuss innovation policy and how NICE and others can improve market access for their members. They have also provided speakers at our annual conference, joining senior NICE leaders on the main stage and in panel discussions. Over the years we have enjoyed a very constructive relationship and that has been to our mutual benefit.

Looking ahead, the ABHI will continue to have a key role in the work of NICE. They have been working closely with us on our new medical technology horizon scanning tool, HealthTech Connect and we are confident we will collaborate constructively as wide scale changes to UK life sciences are realised and rolled out.

As the UK begins to implement these changes, and the NHS gets to grip with the pace of innovation and the opportunities and challenges that presents, we know the ABHI will be there, leading the way for its members and the health technology sector, and that it will continue to be a valued and trusted friend of NICE. Here's to the next ten years and many more.



Sir Andrew Dillon, Chief Executive, National Institute for Health and Care Excellence

The NHS at 70: What Must Happen Next

There was considerable celebration this summer – even by the standards of a World Cup year – as one of the UK’s most cherished institutions, the NHS, turned 70 years old.

But we know from analysis¹ published by the Nuffield Trust and others ahead of the health service’s birthday that, while it is doing well on equity and efficiency, it does poorly in preventing deaths from killer diseases such as cancer and heart attacks. We also know that waiting times² are long and growing and that public satisfaction is slipping³. So how can the NHS turn the tide in the coming years?

Well, the right political support will be important. Change takes time. We must avoid the temptation to reorganise (again), and Whitehall needs to back up what will be some tough decisions made even tougher because so much was made of the Prime Minister’s funding announcement⁴.

After years of funding failing to match demand, that recent commitment to a multi-year settlement is a big step forward⁵, even if it is less than was called for and less than historic levels of growth. This, and the high level of NHS vacancies and providers’ financial deficits, means we cannot expect too much overnight.

There is a £1 billion critical maintenance backlog facing hospitals, and we need to find alternative care for thousands of patients stuck in bed, while reducing the growing numbers of people on treatment waiting lists – now the sad reality for one in 14 people in England.

Regardless of what happens with Brexit⁶, the NHS has an undeniable workforce crisis, with an especially glaring shortage of nurses and midwives and significant problems in general practice. Low morale and cultural issues need more than money, but we still need to bring back nursing bursaries for mature students who want to work in the community, while somehow finding a way to bring back the much-missed experienced staff who have already left.

And the NHS cannot just be a service that treats ill people. Faced with an ageing population, it must do more to help people manage their own long-term health, so investment in public health is vital. Child health, on which we have stalled and now trail most other high-income countries⁷, is a pivotal

place to start. We know that kids leaving primary school are fatter than they’ve ever been, and that unhealthy kids inevitably bring those problems into adulthood.

There are undoubtedly interesting opportunities offered by video and app technologies⁸, but this should not obscure what may be more significant gains from more prosaic improvements in existing data structures, the ability of systems to work together, decision support and the development of analytics.

Of course, such improvements will fall short if we don’t also find bold and enduring ways to fund social care, which has too long been swept under the rug. Under even greater strain than the NHS, it faces a further shortfall if Brexit cuts off access to vital staff. It will require political guts, but without a belated solution on how to fund long-term care – and systems like Japan’s⁹ offer pointers – the next 70 years of health and social care in the UK may not be cause for the popping of corks.



**Nigel Edwards, Chief Executive,
Nuffield Trust**

1. <https://www.nuffieldtrust.org.uk/research/the-nhs-at-70-how-good-is-the-nhs>
2. <https://www.nuffieldtrust.org.uk/news-item/winter-2017-18-the-worst-ever-for-the-nhs>
3. <https://www.nuffieldtrust.org.uk/research/public-satisfaction-with-the-nhs-and-social-care-in-2017>
4. <https://www.nuffieldtrust.org.uk/news-item/funding-settlement-a-big-step-forward-but-pm-s-ambition-for-world-class-nhs-difficult-to-achieve>
5. <https://www.nuffieldtrust.org.uk/news-item/funding-settlement-a-big-step-forward-but-pm-s-ambition-for-world-class-nhs-difficult-to-achieve>
6. <https://www.nuffieldtrust.org.uk/research/brexit-relationship-eu-shape-nhs>
7. <https://www.nuffieldtrust.org.uk/research/international-comparisons-of-health-and-wellbeing-in-early-childhood>
8. <https://www.nuffieldtrust.org.uk/research/the-nhs-at-70-what-will-new-technology-mean-for-the-nhs-and-its-patients>
9. <https://www.nuffieldtrust.org.uk/research/what-can-england-learn-from-the-long-term-care-system-in-japan>

The Three Major Transformations Over The Past Three Decades

Congratulations to ABHI on your 30th anniversary and we wish you every success for the future.

Over the last 30 years our medical engineering work in iMBE has focused on implants and biomaterials for musculoskeletal, cardiovascular and wound care applications. We have worked closely with industry and clinicians from across the globe, to advance and translate new engineering knowledge and technology into improved products and services. We currently host the national UKRI EPSRC Centres for Medical Technology Innovation MTKC and for Innovative Manufacturing in Medical Devices MeDe. We also host the Leeds City Region Grow-Medtech programme supported by UKRI Research England.

Our work on implants and biomaterials, have seen significant changes over the last 30 years, driven by the needs and expectations of an active ageing population, 50 active years after 50[®]. If we go back to the 1980s, orthopaedic joint replacements were most commonly implanted in patients over sixty years of age, often over seventy, with life expectancies of ten years or less. Indeed, a patient in their fifties requiring a hip implant due to osteoarthritis and pain in the 1980s, would frequently be told they would have to wait until they were over 60 before a replacement would be offered. Today more than 20% of joint replacements are implanted in patients under sixty, there is a substantial increase in demand, in patient activities. Expectations of prosthesis lifetimes are now extending beyond 30 years. Successful surgical interventions and implants are driving increased use. Expectations of increased lifetimes and reliability are coupled with the need for improved cost effectiveness in the system.

The last three decades have seen substantial innovation and growth in the use of medical devices, with three major transformations in medical technology and medical engineering, which have substantially altered the products and services being offered to patients across the world.

Up to 1980s, many implants and biomaterials, were designed around "an inert philosophy", reducing adverse reactions and improving biocompatibility. The first transformation came in the 1990s with the introduction of bio-active biomaterials, examples include hydroxyapatite coatings to improve bone ingrowth into and onto orthopaedic and dental implants and anti-calcification treatments of bioprosthetic heart valves. This transformation was supported by the concept of functional biocompatibility of the whole implant system,

whereby it was possible to improve physical functions to improve biocompatibility and extend lifetimes. New concepts and approaches for less invasive surgery were also starting to be introduced at this time, with new forms of endoscopies, arthroscopy and trans-catheter heart valves. Together these technologies form the basis of many of the implant systems used successfully today.

The turn of the century saw new discoveries in regenerative medicine and advancement in understanding of stem cell technology. The conversion of these scientific advancements into new technologies and products has taken time. Increased costs, uncertainties and new regulations have led to longer translation pathways. We are now beginning to see successful products reaching the market, with some cell therapies receiving approval and new regenerative devices and scaffolds leading to improved tissue regeneration in wound care, cardiovascular and musculoskeletal applications.

The third and potentially the biggest transformation of medical devices sector is now upon us, driven by the needs of the ageing population, more cost-effective treatments, increased reliability and extended lifetimes, which require increased levels of precision and stratification, improvements in predictions during design and development and customisation of products which is supported by increased levels of evidence to support adoption. This is beginning to be delivered in the sector by embracing the opportunities associated with the convergence and integration of different types of technologies, (physical /materials, biological and digital) to enable successful development and delivery of third generation, multifunctional, 21st century devices, products and services.

The future global medical technology market is predicted to grow 50% by 2025. There is an opportunity for UK healthcare industries to grow with the market to address global healthcare needs, as well as improving health and care of the population in UK in a cost-effective way. This will need new collaborative approaches to integrate innovation across the whole industry system and value chain, extending from product concepts to service delivery, in order to create successful 21st century products.



John Fisher, Institute of Medical and Biological Engineering, iMBE, University of Leeds

Developing HealthTech - A Supportive Research Landscape

The past 30 years have seen enormous gains in health outcomes and life expectancy, but this in itself poses challenges. While advances in treatments help us to live longer, the resulting ageing population are now living with an increased burden of chronic disease and multimorbidity, which in turn has put extra pressure on our National Health Service.

It offers the most integrated healthcare system in the world and hosts some of the most influential clinicians, academics and experts who are working at the forefront of their medical fields.

In addition, the financial crisis of the past decade has resulted in NHS budgets and services becoming increasingly stretched. While this may appear bleak, the UK is in a uniquely fortunate position to tackle this. For our NHS may be facing challenges, but it is also our greatest asset. It offers the most integrated healthcare system in the world and hosts some of the most influential clinicians, academics and experts who are working at the forefront of their medical fields. This makes the NHS a truly unique environment to generate ideas for new medical technologies and treatment approaches and then to test them in the clinical setting, generating the evidence required for wide use in the health and care system.

As Health and Social Care Secretary Matthew Hancock MP explains in his article, the NHS holds vast amounts of data that, if utilised effectively, can increase efficiencies and drive down costs, as well as bring benefits for the very patients it serves. And it is an immensely valuable resource for researchers, who require well-characterised cohorts of patients to carry out the studies that will lead to the next generation of treatments, and health technologies.

In order to accelerate the time it takes for new drugs, HealthTech and diagnostics to translate from conception through to adoption in the NHS, the Government set up the National Institute for Health Research (NIHR)¹. Established 12 years ago, the NIHR is the nation's largest public funder of health and social care research. The Department of Health and Social Care invests over £0.5bn every year through the NIHR specifically to foster collaboration amongst academics, clinicians, the life sciences industry and charities. This investment funds a broad range of research and development expertise embedded in the country's leading universities and hospitals. This expertise is available

for companies² and charities – including accessing early feedback from clinicians, receiving support to generate the evidence required to get a health product to market, and working with biomedical engineers, statisticians, and specialists in a vast range of therapeutic areas. This broad range of disciplines is particularly important for the HealthTech sector and the NIHR brings this knowhow together in some of the country's leading research facilities to support the development pathway for new technologies and diagnostics.

In fact, the example of using AI to detect eye disease that the Health and Social Care Secretary mentions in his article was supported by the NIHR through the Moorfields Biomedical Research Centre³ and involved a collaboration between researchers from Moorfields and the AI company DeepMind Health.

I have no doubt that it is our NHS, combined with this world-leading expertise of the UK's academic and clinical researchers, that contribute to securing our position as a global hub for life sciences and in particular HealthTech companies. The recent Strength and Opportunity report 31⁴ published by the Office for Life Sciences revealed that there are now 5,649 life sciences businesses with a presence in the UK – a figure that continues to grow year-on-year.

At a time when the UK faces political and economic uncertainty, the life sciences sector has shown its unity and pledged a commitment through the publication of the Life Sciences Industrial Strategy⁵ (LSIS). The industry-led strategy sets out recommendations on how to address key challenges and proposes plans to secure the long-term success of the sector. The ABHI have been a key contributor to the strategy and its ongoing implementation, with Peter Ellingworth, ABHI CEO, sitting on Sir John Bell's LSIS Board, the LSIS Implementation Board and the Life Sciences Council.

In direct response to the LSIS, the Government published its 'Sector Deal'⁶ which pledges £500 million of Government investment, backed by an investment commitment from 25 organisations across the sector, in order to build on the sector's strengths, secure more jobs and drive innovation. The intention is for this investment to foster a collaborative research environment that leads to improved diagnosis of illnesses, new and more effective treatments, and improved standards of patient care. The Sector deal highlights HealthTech as a key priority and includes the pledge of £350m investment into the Leeds City Region to build on its opportunities as a leading MedTech hub.

This investment and commitment sends a clear message – the UK life sciences research is very much open for business. At the NIHR we are continuing to see very positive levels

of engagement from companies looking to carry out their research in the UK and from inventors and SMEs looking to progress their innovative healthcare technologies. We are looking forward to playing our part in the continuing growth and success of the UK's life sciences sector.

If you are interested in finding out how the NIHR can support your company, please contact the NIHR Office for Clinical Research Infrastructure: nocri@nhr.ac.uk



Matthew Hallsworth, Head of External Relations, NIHR Office for Clinical Research Infrastructure

1. <https://www.nhr.ac.uk/>
2. <https://www.nhr.ac.uk/life-sciences-industry/>
3. <https://www.nhr.ac.uk/news/artificial-intelligence-can-detect-eye-disease-as-accurately-as-expert-doctors/9043>
4. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707072/strength-and-opportunity-2017-bioscience-technology.pdf
5. <https://www.gov.uk/government/publications/life-sciences-industrial-strategy>
6. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/665452/life-sciences-sector-deal-web-ready-version.pdf

The Future of Healthcare is Data

We're on the cusp of a medical data revolution.

Imagine a future where...

...your GP explains to you that a company specialising in artificial intelligence (AI) and a pharmaceutical company have collaborated to develop a new medication for your condition.

The medication has become available earlier thanks to research breakthroughs inspired by detailed patient medical data such as yours. Through analysis of individuals from similar backgrounds with comparable medical histories, they have synthesised a drug to benefit your exact condition type.

Your doctor programmes and applies a patch to your skin which will administer the bespoke formulation. From this point on, the wearable tech measures the drug's effectiveness, transmitting data back to your GP and the AI system, allowing them to alter the dosage in real-time via updates forwarded to the patch.

The use of data and technology in this way gives your GP more time to regularly check in on you, helping to maintain the personal relationship so cherished by patient and practitioner alike.

You're satisfied in the knowledge that the technology meets the highest standards of privacy and cyber security protection. The data generated throughout your treatment can help others with a similar profile as yours reach positive outcome faster and importantly, you have the option to opt out if you prefer. The innovation flourishes with the trust of patients.

Our challenge is to bring this vision of the future, into the present.

Our challenge is to bring this vision of the future, into the present. Seven decades of a national healthcare system means seven decades of data accrued on tens of millions of people throughout the years – but only now has diagnostic technologies matured enough to truly exploit this information goldmine.

Harnessing this data provides extraordinary and unrivalled potential to improve our health system and the direct care of millions of people. In the realms of patient safety and integrated healthcare, I believe the benefits will be transformative.

It's happening already. A number of care homes across England are utilising electronic care planning systems which use phone-based voice recognition and afford clinical staff comprehensive data about each patient. New technology measures blood coagulation remotely and emails data to health practitioners. Medication and treatment plans can be altered faster, helping to create preventative and adaptable

care plans whilst saving time and affording nurses an estimated extra hour per shift to care.

Clearly, the potential of new and existing patient datasets is enormous, not just for direct care but for research purposes too.

The take-up of home healthcare technologies, the interest shown by people in monitoring their own health or exploring their genetic makeup through home genome kits, is a trend we need to leverage.

This momentous shift in public behaviour and the technology advancing to match it, will allow increasingly accurate diagnosis and treatments, through the application of AI in pathology and radiology diagnostics in the NHS.

Indeed, Moorfields Eye Hospital recently hit the headlines with its unveiling of an AI system which reviews patient scans, detecting and proposing treatment referrals for more than 50 distinct eye conditions with a speed and accuracy to rival its human peers.

Cutting edge projects such as the development of Digital Innovation Hubs will see the creation of controlled regional environments, providing expert research data services. Through the hubs, we will develop world leading data analysis and sharing capabilities which will propel evermore cutting-edge innovation in research, technology and treatments.

I want to ensure the NHS is at the forefront of this data revolution. Using data in the right way has the potential to increase efficiencies, drive down costs and free time for better quality, doctor-patient interactions in the NHS. More so, it has the potential to positively impact workplace morale – especially if health and care professionals have more time to support their own wellbeing, not just those receiving their care.

But, we need to come together as partners to achieve this.

To those of you who are interested and enthusiastic about the opportunities patient data brings – I want your ideas, I want you around the table.

Let's be clear, the data revolution will not dehumanise the health and care sector – quite the opposite. It will make it more human, bespoke and better equipped to tackle disease and disfunction in all its myriad forms. It's a noble cause and one I am proud to champion – with your help.



Secretary of State for Health and Social Care, Matt Hancock

AHSNS: The Key Innovation Arm of the NHS

This year has seen some important milestones for England's 15 Academic Health Science Networks (AHSNs), which were set up by the NHS in 2013 to drive the uptake of health innovation and support economic growth.

Firstly, the 70th anniversary of the NHS highlights the imperative for our health system to innovate and transform if it is to meet its future challenges and grasp the opportunities.

And secondly, the AHSNs were relicensed by NHS England with an enhanced remit to operate as the key innovation arm of the NHS.

It's no secret the NHS faces unprecedented challenges as it seeks to manage increasing demand. People living longer with more years of ill health, alongside pressures on finances and contraction of social care, makes it harder to provide services that meet the complex needs of our diverse population.

In recent years the NHS has delivered enormous efficiencies but to meet the tomorrow's demands we will need to do things differently: to innovate.

The UK is home to some of the world's best entrepreneurs and unlocking this engine of innovation has the potential to transform health services.

The UK is home to some of the world's best entrepreneurs and unlocking this engine of innovation has the potential to transform health services.

However, spreading innovation is a challenge and it can take fifteen years for medical innovations to progress from pivotal studies to widespread use.

AHSNs help speed things up: we operate locally and also come together nationally to work across health and social care, industry, third sector and with research organisations to progress the adoption and spread of innovative technologies, systems, processes and pathways.

Collaboration between the NHS and industry is critical to capitalising on the game-changing potential of innovation – and in our new licence we will seek to reinforce our collaboration with key organisations including the ABHI.

One of the things that makes AHSNs unique is about the ability to support UK industry to develop innovation, and our track

record speaks for itself: between 2013 and 2018 we facilitated £330 million of investment and helped create 500 jobs.

This was only possible by virtue of the fact we have one of the best MedTech sectors in the world. The NHS and Government – with the support of the AHSNs – must realise this potential for new technologies to drive transformation and generate wealth by exporting innovation.

During our first licence the AHSNs built significant understanding of the enablers and barriers to innovation adoption and spread.

There are many reasons why some innovations gain traction and others that might seem great fail to spread: however the successes share common characteristics including a sound clinical, economic and user-experience evidence base, seeking out champions for change and genuine co-production that seeks out the voice of patients and carers.

Whilst I'm sure these seem obvious points, there are countless examples of projects that fail because they don't take these issues on board.

With this in mind, as part of our expanded roles all AHSNs are running 'Innovation Exchanges', processes funded by the Government's Office for Life Sciences that bring together SMEs with the NHS to match proven solutions to existing challenges.

We also recognise the NHS is complex to navigate, particularly for smaller commercial enterprises, and so we have created the 'Innovation Pathway' to provide advice and support from ideas through to testing, evaluating, developing strong business cases and successful commercialisation.

To find out more about what we do and how we can help contact your local AHSN – our contact details are at www.ahsnnetwork.com

For examples of how we've supported MedTech innovators to develop new technologies, visit the Atlas of Innovations: www.atlas.ahsnnetwork.com



Mike Hannay, Chair of the AHSN Network and Managing Director of East Midlands AHSN

Why Medical Technology Should be at the Heart of the NHS's Long-Term Plan

The NHS faces some significant challenges over the coming decade. Already buckling under the strain of increasing budget deficits and mounting staff shortages, the service faces growing pressure from an ageing population and a funding gap between anticipated demand and what the service can deliver of £30 billion by 2020.

Efforts to remedy the situation have included a savings target of £22 billion, and a wholesale review of the health service's long-term strategy. Whether these measures will be enough to build an NHS fit for the future remains to be seen. However, growing evidence is pointing towards the use of tried and tested medical technology as a way of alleviating long-term pressure on NHS budgets, improving outcomes for patients, and delivering tangible benefits to society.

A key study by the Medical Technology Group – Keeping Britain Working – found that savings of nearly £500 million – alongside better outcomes for around a quarter of a million people – could be generated from the use of just eight existing treatments. These include implantable cardiac defibrillators (ICDs), hip replacements, fibroid embolisation, and quicker diagnosis of sepsis. With over half a million different technologies currently available, these examples represent just the tip of the iceberg.

Yet uptake of medical technology within the NHS is not as good as it could be and often lags behind other Western European economies. The 44 regional NHS plans are evidence of this; analysis by the MTG has revealed that just four of the plans incorporated any meaningful reference to the use of innovative technology.

So where are the barriers?

There are a number of issues. Firstly, technology is wrongly perceived as cost driver. As a result, it is often rationed by Commissioners, eager to make short term savings to their budget in favour of treatments that frequently cost more over the long term. Then, there are perverse incentives which fail to

benefit the budget holder if the impact of the investment is felt in another part of the system.

Above all, we are calling for the wider benefits of medical technology, to society and to patients, to be examined more closely when making investment decisions.

The MTG, along with the invaluable support of its partners such as the ABHI, is determined to address these issues, championing the role of medical technology and recommending ways in which the NHS can embed its adoption into its culture. Among the solutions we believe will enable this are tracking the use of technology across the NHS, greater awareness for clinical professionals, closer working relationships and integration between different NHS organisations to avoid budget silos, and the appointment of a Medical Device Officer in every region. Above all, we are calling for the wider benefits of medical technology, to society and to patients, to be examined more closely when making investment decisions.

Overcoming the barriers within the NHS won't be easy, but it is essential if the health service, our wider economy, and most importantly patients, are to feel the true extent of the potential benefit of medical technology in the future.



Barbara Harpham, Chair, the Medical Technology Group

Transforming the Future of Healthcare

The UK's reputation as a leading centre for HealthTech is in part due to our strong academic base, with clusters of start-ups having developed around leading universities in London, Cambridge and Oxford. The greater south east of England's top research institutions, thousands of scientists, deep experience in clinical trials and the UK's open regulatory environment, combined with the expertise of London's tech ecosystem make for a very fertile territory for HealthTech.

This year has brought headline-grabbing success for the region's start-up community with companies such as CMR Surgical's record-breaking \$100m fundraise for their small, portable and cost-effective robotic system, and Babylon Health pledging \$100m to develop the world's leading healthcare AI platform.

The UK benefits from a strong and supportive ecosystem, with organisations such as MedCity and memberships bodies such as the ABHI helping to connect and strengthen relationships between industry, academia, the NHS and Government.

The UK benefits from a strong and supportive ecosystem, with organisations such as MedCity and memberships bodies such as the ABHI helping to connect and strengthen relationships between industry, academia, the NHS and Government.

We are currently working with NHS England, NICE, Public Health England and DigitalHealth.London (DH.L) on a project to create a set of standards and a tool to help companies to understand what 'good' evidence for digital innovations looks like. This is due to launch in December this year and is part of the Government's Code of Conduct, which aims to create a safe and trusted environment for innovation to flourish.

The capital has the benefit of DH.L, who help to speed up digital health adoption by bringing together clinicians, healthcare providers, research institutes, entrepreneurs and

industry to give companies a clearer route to market. DH.L's Accelerator programme launched its third cohort this year and saw its expansion into four more regions across England. With alumni including Echo, Andiamo, and Mira Rehab, the Accelerator has saved more than £50m for the NHS, working with 60 companies, and generating 169 jobs for London in just two years.

MedCity recently returned from a mission to Japan and Korea, where we led a 50-strong delegation of companies and academics to showcase the UK's life sciences sector. Artificial Intelligence (AI) was the flavour of the year, with its potential to revolutionise the drug discovery paradigm. AI is already being used to detect diseases more accurately, unlock vast amounts of health data and use pattern recognition to identify patients at risk of developing a range of diseases. Accenture estimates that AI could add in the region of £654bn to the UK economy by 2035, with our strong life sciences and healthcare industry expected to capitalise on these intelligent systems. London is home to over 100 healthcare and life sciences AI suppliers, including world-renowned companies such as BenevolentAI and DeepMind Health. BenevolentAI is disrupting the pharma industry in a big way, by helping to lower costs, decrease failure rates and increase the speed at which medicines are delivered to patients. And this year, DeepMind Health and Moorfields Eye Hospital developed an AI system able to detect eye conditions in seconds and prioritise patients needing urgent care, matching the expertise of doctors with over 20 years of experience.

This is just a snapshot of some of the exciting innovations and projects happening in the HealthTech sector. Even as we enter into a challenging year politically, the research and innovation that exists in the UK will continue to transform the future of healthcare.



Sarah Haywood, CEO, MedCity

Value: Improving Health Outcomes for as Low a Cost as Possible

One global truth is that the costs of healthcare are rising rapidly and improvements in health are not necessarily proportional. Across the world, inflation in healthcare has outpaced overall inflation. While some developing countries are seeing improvements in longevity and other health metrics as their economies mature, developed countries are not experiencing the same improvements in health. For example, life expectancy in the United States has actually declined in the last two years while spending continues to increase, now accounting for approximately 19% of gross domestic product.

Advances in technology have tended to lower prices and increase quality for nearly every industry. Service industries have seen substantial productivity gains, generally associated with enhanced performance, enabled through technologies that allow data to be used more fluidly and that permit some functions to be automated. Health care appears to be a very notable exception. Electronic health records, the largest area of investment, have reduced practitioner efficiency and failed to significantly improve outcomes. Furthermore, they have been pegged as the most important source of physician dissatisfaction in the US.

Technology will have a major positive impact on quality and efficiency in healthcare, but barriers are slowing the pace of innovation and dissemination. Healthcare markets are far from efficient with many disjointed interests built on long traditions and an underpinning of clinician autonomy. Hospitals, nursing staff, and physicians are often led by distinct entities that may be at odds with each other. Fee-for-service underpinnings in many countries, even in some single-payer systems where clinicians are rewarded for productivity, change the focus from achieving better outcomes to producing more healthcare, whether truly beneficial or not.

A focus on value—improved health outcomes for as low a cost as possible—could change the goals of the health system to those desired by society. All consumers and their employers want better health with minimal waste. Given the power of this logic, a shift in reward mechanisms to embrace value is inevitable.

At Dell Medical School at The University of Texas at Austin, we have a mission to accelerate innovations in the health system centered on value. We start by focusing sharply on what people want using methods of human-centered design. We then ignore the current payment system and build ideal care to deliver those outcomes, also enhancing the experience and

reducing waste. With current systems optimised to produce more healthcare, it is easy to find tremendous waste in the system. Team-based care and technologies are introduced to address specific needs in the care model. Prevention and health promotion naturally come to the fore because they are so well aligned with our desire to remain healthy and avoid healthcare.

The results so far have been remarkable. By focusing on specific conditions, we have been able to demonstrate improved outcomes at lower costs. For example, our system of care for joint pain produces much better results than approaches previously available in the community and costs at least 30% less. The approach has drawn the interest of several partners, large and small, who are interested in navigating a future focused on value-based care. Notably, Merck moved an IT innovation hub into our research building and Medtronic is partnering in projects related to shared decision making.

Here in Austin, we welcome international health IT interests as a way to stimulate the ideas and opportunities for all of us.

Working across international barriers has numerous potential benefits. First, exposure to different healthcare systems stimulates creativity but clarifying that local practices are not necessarily optimised. Second, differences in procurement, coordination, and business incentives allow for markets that may not be available in another country. Third, access to capital and talent may be eased by greater international exposure and sourcing. Here in Austin, we welcome international health IT interests as a way to stimulate the ideas and opportunities for all of us. Our existing relationship with ABHI has already produced important rewards for us and for our hosted companies.



S. Claiborne "Clay" Johnston, M.D., Ph.D.
Dean, Dell Medical School, Vice President
for Medical Affairs, UT Austin, Frank and
Charmaine Denius Distinguished Dean's
Chair in Medical Leadership

A Reflection on the Early Days of ABHI

Thirty years is a long time in business but the origins of ABHI go back further. In the early eighties a group of trade associations, in what is now called HealthTech, combined to provide a single voice to talk to Government. A loose federation was formed and named BHTIC (the British Healthcare Trades and Industries Council). And the main issues to be addressed were – guess what – NHS procurement and product regulation. In 1988 BHTIC merged with the BHEC (British Healthcare Export Council) to form ABHI, adding international trade to the portfolio.

However, it was regulation that initially became the lead issue because of the emerging plans for an EU single market. And it was regulation that provided the background for what was undoubtedly the key achievement of this early part of ABHI's history. Regulatory systems around Europe varied significantly (where they existed) and it was a group of forward-looking Brits, working under the umbrella of ABHI and Eucomed, who led the way. They took the initiative in proposing to the EU Commission a pan-European system of medical device regulation to harmonise the disparate regimes and thus underpin plans for a single market. Individuals such as Malcolm Carlisle and Peter Styles, working with colleagues from the forerunner departments of the MHRA, led the way in creating a framework for device regulation which is still with us today and which has been a huge benefit for patients and clinicians as well as for the smooth running of the single market.

In today's febrile political climate, it is important to remember that this initiative was a shining example of what could be achieved by deep and positive engagement in the EU by a proactive group from the UK.

In today's febrile political climate, it is important to remember that this initiative was a shining example of what could be achieved by deep and positive engagement in the EU by a proactive group from the UK.

In the next thirty years ABHI continued to follow this positive approach of full involvement in EU processes, particularly in our case in regulation and the supporting product standards.

Of course, many more and quite different achievements have followed in subsequent years, but these are not the subject of this reflection. From humble and under-resourced beginnings, ABHI is now a highly professional and widely-respected organisation, staffed by well-qualified experts steeped in experience from across the HealthTech sector. Contacts at every level of Government are greatly enhanced and the depth of involvement in the major issues of the day is comprehensively covered and necessarily more nuanced.

But some things don't change. We are still inexorably involved in issues flowing from how the NHS procures our members' products and how those products are regulated. In many ways regulation defines the boundaries of our industry including, for example, the expansion of those boundaries into specifically data-driven products.

The challenges in regulation and trade posed by the UK leaving the EU will hopefully be mitigated by the fact that the EU system (to which we broadly expect the UK will adhere) is recognised internationally by many jurisdictions. Our regulators are already acknowledged as global leaders and are expected to play a major part in future global harmonisation of the rules governing medical devices.



Mike Kreuzer OBE, Advisor, Regulatory Policy, ABHI

Harnessing the Power of Data

In spite of its recent challenges, the NHS has remained the envy of the world. But if it wants to sustain this reputation for another 70 years, the NHS must show that it can harness modern technologies to improve healthcare and realise the enormous benefits these innovations can bring to patients.

Examples of such advances were abundant in the Science and Technology Committee's recent inquiry into genomics and genome editing in the NHS. We heard about the potential for genomic medicine to provide diagnoses to patients with rare diseases who could otherwise face years of uncertainty; to tailor treatments so that adverse reactions are avoided and the most effective medications chosen; and to facilitate the discovery of transformational new drugs. We are on a trajectory that might, one day, make certain genetic diseases such as cystic fibrosis 'curable' – a prospect which seemed unthinkable just a few years ago.

As a single national healthcare system, the NHS collects data on a scale that is unrivalled.

However, it's no secret that we have been too slow to adapt to this revolution in healthcare. Funding constraints and the sluggish progress in developing the NHS' digital infrastructure are well-known, and were both prominent themes throughout the Committee's inquiry. As a single national healthcare system, the NHS collects data on a scale that is unrivalled. Harnessing the power of this data is critical to enabling the adoption of genomic medicine and improving patient care, while it could also facilitate more innovative and flexible pricing schemes, such as outcomes-based pricing, to get cutting-edge treatments to patients as quickly as possible while ensuring that the financial risk is shared more fairly between the NHS and industry.

The Government must invest in the infrastructure needed to capitalise on these opportunities. Genomics England and the NHS must also be ambitious in recognising the

potential for anonymised data to support the development of new treatments, in partnership with research institutes and industry, while ensuring that appropriate consent and data security safeguards are in place.

Our ability to achieve these benefits will depend heavily on public support. Care.data, NHS England's much-maligned data-sharing initiative, failed to win the public's trust and was ultimately shelved. New technologies will raise other ethical dilemmas, particularly when it comes to genome editing. Which conditions would it be appropriate to 'edit away', and what would that mean for people who are already living with that condition? We need to get beyond tropes of 'designer babies' and sensibly debate the ethical implications of new technologies – informed by expert opinion but fully engaging with the public.

It is concerning that, with the Genomics Medicine Service due to roll out across NHS England this October, a recent survey of the general public conducted by the Wellcome Sanger Institute found that 82% had either never heard of the term 'genomics' or had little understanding of it. This presents a headache and a wake-up call for policymakers, who cannot expect the public to have confidence in something without first being clear about its benefits.

The role of Government in supporting technological advances in the NHS is clear. We have had some notable successes in recent years – including the 100,000 Genomes Project and Parliament's landmark vote to change the law on mitochondrial donation – but there can be no room for complacency. With more revolutionary technologies on the horizon, we must continue to support their development and deployment so that patients can enjoy the highest standards of care in a world-leading 21st century health service.



Rt Hon Norman Lamb MP

Reworking the Deal Between the Seller and User

If you sit in an industry seat in health technology there is often the feeling that ideas, development, investment and certification are hard enough to put together. But when you approach the NHS in the UK to get your product sold it feels twice as hard.

If you sit in an NHS seat as a busy clinician in a leading health service your eyes may sometimes glaze over when contacted by a HealthTech firm, however prestigious.

If you sit in an NHS seat as a busy clinician in a leading health service your eyes may sometimes glaze over when contacted by a HealthTech firm, however prestigious.

It will be another attempt to interest you in a device which may look marginally better than the one you currently use but with no understanding of the environment you would be using it in, the staff who would be using it alongside you, or what effect it might have on the clinical pathway. And all this is before whether anything new can be afforded by today's NHS.

So, if the seller and the user usually start in these different places it is good that leading ABHI members and leading health and science groupings are reworking the deal. The Cambridge Biomedical Campus is now host to a range of industry partners. These include HealthTech giants such as Philips and GE, working with Cambridge University Hospitals and the Royal Papworth Hospital, with others likely to follow in the next few years. The firms are committing resources – equipment, software and people – to a development partnership with the clinicians and academics very directly. They are also buying clinician time, so they get the attention they need. And the Cambridge partners are together working on access to data – anonymised and pseudonymised; clinical, imaging, pathology – so that service improvement, academic rigour and commercial development can operate in the same space without prejudice.

For ABHI members this is the sort of deal which will allow them to reinvent a time-consuming and expensive business model. Why run a complex and expensive R&D workforce if you can defray these costs and increase scientific rigour by drawing on centres of excellence in science – clinical, engineering and physical? This is very easily achieved in Cambridge where the science is either co-located or close by. Industry also needs high performing clinical services to develop products which add value to pathways and the daily lives of patients and clinicians. In other words, firms move from developing products to devising solutions.

ABHI has worked in the background, encouraging members to do their due diligence to identify the partners they need – Cambridge, Leeds, Manchester. Working through a Memorandum of Understanding with ABHI has given a greater sharpness, beyond a sense of one-off deals. The leadership of ABHI uses its off-stage diplomatic skills to pull people together, identify areas of convergence with health and science partners on the Campus, and to keep the channels open for further development.

This leads from the local to the national and international. We recently, along with Manchester and Oxford, signed a "BioBridge" partnership agreement with the outstanding biomedical campus in Houston, Texas. That work started from an ABHI linkage of Cambridge to Houston. There will be more of these to come. ABHI's work with its members to land them in the US is a big part of that.



**Malcolm Lowe-Lauri, Executive Director,
Cambridge University Health Partners
(CUHP)**

To the Machines that go Beep

If there are unsung heroes in the NHS and there certainly are; porters and estates people and coders and all the rest, there are also the 'invisibles' who diagnose us, keep us safe and keep us ticking over.

We go into hospital or the GP surgery and we are surrounded by them. So much are they the familiar landscape of healthcare they become invisible.

**The invisibles; the machines that go beep,
the machines that keep us alive, the
machines that measure, the machines tell
us what we need to know, give us news,
good and bad.**

The invisibles; the machines that go beep, the machines that keep us alive, the machines that measure, the machines tell us what we need to know, give us news, good and bad.

The medical device industry, so much part of our healthcare and well-being.

There are a lot of things for the NHS to be worrying about; workforce planning, a digital strategy, cost-containment... we've never worried about the HealthTech/device industry. It's always been there, keeping us safe. Now, I think we should.

The management of patients through the use of health technologies is commonplace. We depend on it and as we move from an analogue, to a digital NHS, expect it to do more, manage better and our interdependency with the industry and its innovations will become greater.

My worries come in the cloud generated by Brexit.

My visits to Europe and conversations with businesses across the Channel, should reassure me that EU business no more want a clogged-up, clunky export system, any more than we do.

As much as EU leaders may play hard-ball, they know that supply chains and market access is as important to 'their' businesses as it is to 'ours'.

Except, I have a nagging doubt.

The UK device industry is the third largest behind France and Germany, but our domestic device manufacturing is a patchwork of small enterprises, working in the shadow of a few global players.

If the complexities of trading, post-Brexit, are tedious or create friction, the big players will relocate, because they can.

Smaller organisations will be left to struggle with whatever the Brexit legacy might be. We know the NHS is a slow adopter of technologies, reimbursement mechanisms, labyrinthine and device revenues smaller compared to even Italy and Spain.

The NHS is slowing up and waiting lists are now in the region of 4m people. Device consumption is slowing. The NHS has been an iconic but small market and is unlikely to become the first choice for innovation launches.

The fall in the value of the pound is a double-edged sword. Good if you export, bad if your product contains imported components.

Leavers will say, when the post-Brexit dust settles, markets will bounce back, but in the meantime, loss of traction and regulatory delays, may mean bouncing back is not enough.

There is a huge amount for this sector to celebrate, be proud of and put in the nation's shop window. Innovation, robust management, entrepreneurial determination all mark out the device and tech sector as a part of the economy that is precious to us and in many respects leads the way. We must look after it.

Under the collegiate leadership of the ABHI, for 30 years the industry has flourished, saved lives, extended our well-being and played an invisible role in family life.

It is part of the NHS family and like all families, facing challenges, it is time to keep together, value what we have and face the future with the confidence that has created such a distinguished past.

To the machines that go beep, the joints that don't creak and the all invisibles...happy birthday and thank you.



Roy Lilley, Health Policy Analyst, Writer, and Commentator

Turning Obstacles into Milestones: The Role of Technology in Facing Today's Healthcare Challenges

As the CEO of a health technology company and board member of the ABHI, I can confidently say that technology has a crucial role to play in enabling better care for patients and supporting the long-term future of the NHS. My belief and passion is shared by health officials and those in senior Government; for example Lord Darzi's Review of Health and Care (June 2018) called for a comprehensive strategy to harness 21st century technology and innovation at pace¹. Similarly, the Government has pledged an additional £20.5 billion to the NHS over the next five years, citing technology as a key component to drive productivity and disease prevention.

At Philips we constantly evaluate how technology can help improve people's health and wellness, and where we should focus our attention to support as many people as possible while never overlooking those who need specialist care. We are not alone in asking these questions – our sector colleagues discuss similar topics on a daily basis. From the perspective of Philips in the UK there are some pressing challenges we are committed to taking on, to ensure people live well and the NHS continues as a global innovator.

System capacity and preventative care

One considerable challenge we currently face is capacity in the healthcare system, and I believe that health provision needs to increase the pace of its journey toward a 'predict and prevent' model to redress this. With the evolution of medical knowledge to-date, our health system has had to 'treat illness.' The problem with this is two-fold. Firstly, treating patients once illness is established means a more costly intervention, possibly within an acute-setting. Secondly, the more advanced the illness the bigger the toll on the patient and their loved ones, with less favourable outcomes. As technology unlocks new possibilities and knowledge at a blistering pace, we have an opportunity to revolutionise healthcare by using advanced methods of information collection and analysis to move the model to a front-loaded, lower-cost system.

Part of meeting this challenge is to seize an opportunity – our ability to use technology to prevent illness. At Philips we are committed to improving seven billion lives by 2025, and I believe that the integration of information across personal and clinical devices can help establish a preventative system that is focused on, tailored to, and powered by motivated users. Preventative health incorporates two core elements; health maintenance – ensuring the body is in sustained good health

– and early detection – identifying disease early to increase the chances of getting the best possible outcomes from treatment. If we can evolve our current system to a coherent, evidence based, model of care that supports people to remain well, I believe the positive impact on society and individuals will be considerable.

Philips is determined to help future-proof the NHS, so we are constantly looking for ways to use information to improve care delivery. For instance, we are working with NHS partners to establish digital pathology networks as a way to reduce inter-observer variance and increase diagnostic speed across care sites. The net result should be earlier patient diagnosis, reduced treatment costs and improved outcomes. Our experiences to-date have been extremely positive and we are working hard with Government to help provide these benefits to as many people as possible. Another example is our TissueMark system, which quantifies samples and informs the pathologist whether there is sufficient tumour material for robust analysis or whether more samples are required. This large-scale data matching exercise is something the human mind cannot do, and it helps ensure that the patient experience remains paramount with each procedure only being as invasive as it absolutely has to be.

Across all our work Philips is committed to collaboration, as our technology in isolation can only do so much. An organisation like the ABHI offers access to a forum of 30-years expertise, in which challenges and experiences can be worked through collaboratively, in a non-partisan fashion, to ensure better healthcare for patients and professionals alike. As a proud member and champion of the ABHI, I value its contribution to our healthcare system and our society.



Neil Mesher, CEO, Philips UK and Ireland

1. Better Health and Care for All. A 10-point-plan for the 2020. <https://www.ippr.org/research/publications/better-health-and-care-for-all>. Last accessed 23/06/2018.

Are Patients not Pushing Hard Enough to Access Innovations?

There are obvious imperatives for patients to be able to access the latest health innovations: once a beneficial technology has been created, how could it be considered acceptable for patients to be denied it? Well, we can immediately see that there is more at play here than a simple moral imperative – for instance, if the cost of the technology vastly outweighs any possible calculation of the benefit, demanding it becomes much harder.

So, we need to think very clearly about the nature of demand from patients for innovations. The first thing we need to consider is: is demand there at all?

So, we need to think very clearly about the nature of demand from patients for innovations. The first thing we need to consider is: is demand there at all?

One of the most interesting pieces of research published around the NHS's seventieth anniversary was The King's Fund's research on the public's expectations of the NHS. It found, contrary to the oft-asserted view that patients' demands are increasing in line with the expectations they hold as consumers, that in fact patients are willing to make allowances for the NHS. They know it is free at the point of use, they recognise it is under pressure, and they perceive its staff are doing their best; so they can be willing to accept levels of service that they would not tolerate from a private company.

In many ways, the implications of this are positive: healthcare is not widely seen as a consumer good. If we were to shift to a system involving up-front charges, we can be sure that wealthier people would increasingly see health as a consumer good, and spend more of their income on it, while the less well-off would go without – with all the inequities that brings. It's reassuring for the future of the NHS as a tax-funded service, free at the point of use, that a consumerist approach seems to run counter to our society's fundamental instincts about healthcare. But this relatively forgiving view of the NHS may also bring downsides: are patients in fact not pushing hard enough to access innovations?

In practice, patients can make demands if it comes to it. We have all seen crowdfunding initiatives for a seriously ill individual to get 'the latest' treatment: sometimes well-evidenced drugs that nonetheless haven't made it past NICE's threshold or NHS England's commissioning decisions yet; sometimes highly dubious treatments offered overseas that on closer inspection appear not to be clearly supported by medical science.

But in a sense these instances illustrate that it is hard for individuals to make demands on the NHS when they need treatment or care, particularly if it is innovative. Because it is funded by tax, the NHS is at pains to make decisions equitably. Ethically speaking, patients may consent to treatment, but not command it. So direct demand by patients is not an obvious route to driving the uptake of new technologies. The widespread hand-wringing about the NHS being slow to pick up new technologies is largely justified.

There's no single answer to these problems, but undoubtedly patient organisations and the voluntary sector have a significant role. They can help to inform patients of what innovations might be available, and often they are key in pushing for their uptake on the NHS, through NICE appraisals, NHS England's commissioning processes, and by funding clinical trials and other research to prove efficacy in the first place. They are also a key route to patient involvement: hopefully those charities that fund research listen to what's important to patients (though there can be tension there between what people would like and what science is pointing to as feasible). Other actors in the innovation arena are, happily, also pushing to a more patient-centric approach, with patient reported outcomes increasingly recognised as important alongside 'hard' clinical measures during the development of new technologies. What's clear is that patients have vital roles from the earliest stages of identifying new approaches through to securing their use in the NHS – and at every stage, those roles probably still need expanding and strengthening.



Rachel Power, Chief Executive Officer, The Patients Association

Academic Entrepreneurship: From Counter-Terrorism to the 21st C Thermometer

Academic entrepreneurship is quite rare amongst British professors, but while I was at Stanford the idea of founding a company seemed obvious.

I founded my first company, EvanesCo Ltd, immediately on leaving Stanford, joining the University of Exeter just after 9/11 – in the field of counter terrorism. Timing is clearly important although spin-out company number two, Attomarker Ltd was more pre-meditated.

An EPSRC Basic Technology call was launched to look for the next basic technology to change society – something like the next generation laser or microscope. Our idea was multiplexed screening of blood, label-free to look for the evolution of panels of biomarkers in disease and more generally proteomics.

Evolving biomarker panels profile the patient's response trending up or down with infection or disease. The biophonic platform uses gold nanoparticles to scatter light. The iPhone 6 camera had sufficient sensitivity and the processor was able to interrogate the image. Printing into an array, the camera can image more than 150 spots on which we can perform different blood tests.

In the laboratory we can see 5,000 spots and image potentially two-thirds of the blood proteome. In the iPhone we are concentrating on a series of well-established blood tests providing a clinical chemistry laboratory in the hand – giving results in five minutes.

We can extend the role of the pharmacist and ultimately into the home as the equivalent of the 21st Century thermometer, supported with teleconsultation.

Attomarker has many opportunities. Rapid C-reactive protein testing for antimicrobial resistance, an antibiotics test at the beginning of every GP consultation. We can extend the

role of the pharmacist and ultimately into the home as the equivalent of the 21st Century thermometer, supported with teleconsultation.

More importantly, the data can be shared so we can monitor the evolving flu epidemic, giving the first real-time view of public health. We can make the biomarker panel more complex and look at other factors of the host response, or a drug such as immunotherapy where the drug concentration can be measured, together with a pain marker as well as the acquired immunity.

Cohort tele-surveillance allows a new remote management of patient groups with specific long-term challenges, precision medicine requirements. Post-chemotherapy – 'the chemotherapy is painful, but the pneumonia nearly killed me' – we invest a large amount of money in complex therapy and for want of an early intervention, an immunocompromised patient dies from a chest infection.

Exploiting the technology requires a spin-out to be connected to its customers and opportunities. ABHI made some important introductions including a showcase at Medica – the IVD industry in one place.



Prof Andrew M. Shaw, Chief Executive Officer, Founder, Attomarker Ltd

Shared Values and Vision: ABHI and AdvaMed's Transatlantic Commitment to Ethics & Patient Access to MedTech Innovation

Medical technology innovation accelerated dramatically in recent years, with scientific advances unimaginable 30 years ago when ABHI was formed. Simultaneously, the MedTech industry globalised; and even small startup companies early in their growth now bring new innovations to benefit patients everywhere. Indeed, across the Atlantic and worldwide, we regularly witness the development and application of exciting, life-changing medical technologies, including robotics, 3D medical printing, nanotechnology, and the internet of medical things, along with new ways of incorporating these new technologies into health systems to achieve better outcomes and greater value for patients.

This fast pace and global exchange presents both opportunities and challenges for industry, especially as MedTech companies seek to navigate complex regulatory frameworks across multiple countries. While science may know no borders, regulation, culture and procurement models do—and these can sometimes impede or stall patient access to these exciting technologies.

That is why AdvaMed and its members especially value our relationship with ABHI, which has been a trusted partner for US MedTech companies doing business in the UK, and for the many MedTech companies with operations in both countries. ABHI and AdvaMed working together created the Medical Technology Group – a unique patient-industry advocacy platform to advance our core mission of severing patients in the UK and around the world.

I have been particularly impressed with ABHI's longstanding leadership on ethics, integrity and industry reputation. Reflecting over the years, I am particularly proud of our common emphasis and exchange on corporate compliance and promotion of ethical business practices. ABHI and AdvaMed share common values in this area, and our organisations have long been leaders in developing voluntary industry codes of ethical business practices.

No patient anywhere should wonder whether a technology prescribed for them is made for any reason other than their own best interest.

Both codes seek to ensure that interactions between member companies and health care professionals are transparent, independent, and foster medical decisions based on the best interest of patients. No patient anywhere should wonder whether a technology prescribed for them is made for any reason other than their own best interest. At the same time, our codes recognise the importance of substantive exchanges between innovators and health care professionals to support continued medical research and development and ensure safe and effective use of medical technologies.

One of the newer areas of collective compliance focus – and where ABHI has been a notable leader – is “upstream compliance,” or the promotion of ethics and human rights throughout the medical technology supply chain. Trade associations have an important role to play in improving awareness of ethical trade principles and partnering with policymakers to develop effective and workable solutions. We are also committed to helping member companies comply with recent laws seeking to combat the use of slavery/forced labor in manufacturer supply chain. Furthermore, leading MedTech companies on both sides of the Atlantic are distinguishing themselves by implementing robust corporate responsibility policies that address a wide range of other social and environmental concerns.

We know that the global MedTech industry will continue to evolve – likely at a faster pace than regulatory frameworks can adapt. Through our continued collaboration, however, we can foster an environment that supports MedTech innovation worldwide and mitigates potential roadblocks to the transformation of patient care.

Congratulations, ABHI, and thank you for all you've achieved for patients everywhere!



Christopher L. White, COO & General Counsel, AdvaMed

The Role of the Regulator in Balancing Prosperity and Protection

Industry associations like the ABHI are vitally important interlocutors for regulators, especially if they can generate and act upon the collective views of their members, which constitute a broad cross-section of the industry.

ABHI was founded in order to be inclusive and reflect the breadth of the medical device industry. They have been effective

in ensuring that the industry's views on policy and regulation have been collected and collated in ways that help the MHRA to understand the implications of changes to legislation, policy and implementation.

Regulation is at its most effective when the industry have a strong engagement with and understanding of the regulatory context in which they are operating.

Regulation is at its most effective when the industry have a strong engagement with and understanding of the regulatory context in which they are operating.

Initiatives such as the ABHI Code of Ethical Business Practice support the development of such an environment and I would like to see greater partnership working between MHRA and ABHI in the future to continue to build a healthy and vibrant sector, recognising the pivotal role a regulator can have in balancing prosperity and protection.

It is no coincidence that the ABHI was founded during the formative days of the development of a European regulatory system. Stakeholders from the UK were highly influential in pushing the case for a harmonised EU system and saw the

benefits of regulatory harmonisation, both European and on a global scale, for all parties. Patients benefit from consistent standards applied across often complex global supply chains in terms of both safer products and the removal of duplication of regulatory demands which can drive up costs and prices.

At a practical level the MHRA needs to consult on a wide variety of issues and relies on the ABHI, and like organisations, to respond with well-considered and drafted consensus positions which can help the MHRA, and UK Government more broadly, generate proportionate and workable policy and legislation.

The dual challenge of a comprehensive upgrade of EU medical device legislation and the impact of Brexit require a sure-footed approach so that patients in the UK are not put at risk and the benefits of the hard work put in over many years to improve the performance of the regulatory system are not lost or compromised. I am confident that, whatever the challenges, the ABHI will continue to be a key stakeholder for the MHRA to help to support the transition to whatever the future holds. The significant challenge is managing this in a way that focuses on the dual goals of improving patient outcomes and getting the best out of the UK life sciences ecosystem in support of patients, the NHS and our potential as world leaders in the development and commercialisation of innovative technologies.



**John Wilkinson OBE, Director of Devices,
The Medicines and Healthcare products
Regulatory Agency**

The Future for Medtech in the North of England is Very Bright Indeed

The North of England has a thriving sector in life sciences – last year alone it grew by £4.4billion, from £9.2bn in 2016 to £13.6bn in 2017.

This is a rise of 48% according to an analysis of figures from HMG's Office for Life Sciences, Strength and Opportunity 2017: the landscape of the medical technology and biopharmaceutical sectors in the UK report. A growth rate 4.8% higher than the national average.

The North is home to 21% of the total UK life science sector workforce, 19% of the UK biopharmaceutical sector workforce, 22% of the UK medical technology sector workforce and a very significant 29% of the UK digital health workforce.

Medical technologies are central to these figures. The North is home to 21% of the total UK life science sector workforce, 19% of the UK biopharmaceutical sector workforce, 22% of the UK medical technology sector workforce and a very significant 29% of the UK digital health workforce. The number of companies in life sciences in the Northern Powerhouse has grown by 755 in the past year.

There are a great many reasons for this. The region is leading on clinical trials with Newcastle Hospitals NHS Foundation Trust topping the league tables for national clinical research activity seven years running.

Support for life sciences is being built into infrastructure across the North, with leading incubators including Alderley Park in Cheshire, City Labs in Manchester, Nexus in Leeds, Helix in Newcastle and the Olympic Legacy Park in Sheffield providing the right environment for life sciences SMEs to develop and grow.

This work is underpinned by the Academic Health Science Networks across the North, who working together, and separately, are excellent at spreading innovation through the health service.

The North is also leading on the convergence of health tech with life sciences. The Leeds City Region has pioneering MedTech expertise, which has seen it awarded a Science and Innovation Audit. There are around 250 businesses in the region specialising in MedTech and another 200 digital and technology firms operating in the health field. Nearly a quarter of the UK's digital health jobs are in the region.

This expertise spreads out across the North however – Connected Health Cities, with its central hub in Manchester but four regional hubs spanning the North's geography, is pioneering the use of health data, informing new treatments and setting new standards in putting the citizen at the heart of how their health data is used.

TITCH in Sheffield are looking at child-specific technologies – an area which is too often over-looked in MedTech. Through its work with companies, academics and health professionals it is pioneering new medical technologies which work for children's often very different needs.

The NHTA is also working closely with MedTech companies and clusters internationally, in particular with Japan, Singapore and Israel, where we have made close links with their exciting MedTech sector. Earlier this year we signed MOUs with both Israel and Singapore to make it easier for their companies to work with the North of England and wider NHS.

Increasingly in an ever-connected world we all need to work in partnership. That's why for the Northern Health Science Alliance it is so important to work together with organisations like the ABHI.

By keeping channels of communication open and by working to our collective strengths, we know that together with great organisations like the ABHI that the future for MedTech in the North of England, and the UK as a whole, is very bright indeed.



Dr Hakim Yadi OBE, CEO, Northern Health Science Alliance

What Innovations Will Have the Most Impact over the Next 70 Years?

In light of the 70th birthday of the NHS, one question I have been commonly asked is, 'What innovations will have the most impact over the next 70 years?'. If that question had been asked in 1948, would anyone have been able to predict the many advances that have transformed healthcare, almost beyond recognition? However, if we look at some of the innovations in the last decade or so I think the direction of travel and key areas for transformation can be identified.

When I first started in my role four years ago, I was only approached by a handful of companies utilising machine-learning and AI; this year I have already met with over 100. There can be no doubt that AI will have a significant role in the future of healthcare. Similarly, work had just begun on the 100,000 Genome Project - and we will deliver on that promise this year. To build on the project, the NHS Genomic Medicine Service will support the next phase of the Government's ambitious vision for genomics by sequencing up to 500,000 whole genomes over the next five years. In addition to AI and genomics, many other technologies are set to have a significant impact, including digital health, predictive analytics, advanced/semi-autonomous robotics, social networking, connected devices, virtual and augmented reality, drones and block chain. Embracing advances in technology will be a key component allowing us to move from a reactive and intermittent care service for the sick to a proactive and continuous healthcare service.

So, with that in mind, what does this mean for those in the system that are tasked with supporting the development and adoption of innovation in the NHS? Innovation is not just about generating good ideas - we've never been short of those - it's about aligning priorities and supporting the culture of adoption and spread. Nationally, this means creating the conditions for new innovations, whatever they may be, to flourish and spread by signaling these better to the wider system, and enhancing and simplifying each stage of the innovation pipeline from the research lab to routine uptake.

We must build upon the strong track record of research within the NHS to maximize the benefits to patients, by increasing the number of participants and simplifying the NHS research

processes. But this must be done in tandem with the better articulation of the NHS's own research priorities. Steps toward these have already been made, such as the publication of NHS England's Research Needs Assessment 2018 in collaboration with National Institute of Health Research.¹

We want to lead the world in being able to develop and adopt proven and affordable interventions, rapidly and effectively at scale. Building on our existing strengths, this means continuing to support real-world testing, speeding up adoption through accelerators, and aligning incentives. The recently relicensed Academic Health Science Networks will be a key part of our support offer for innovation from proof-of-readiness for national spread to export support.

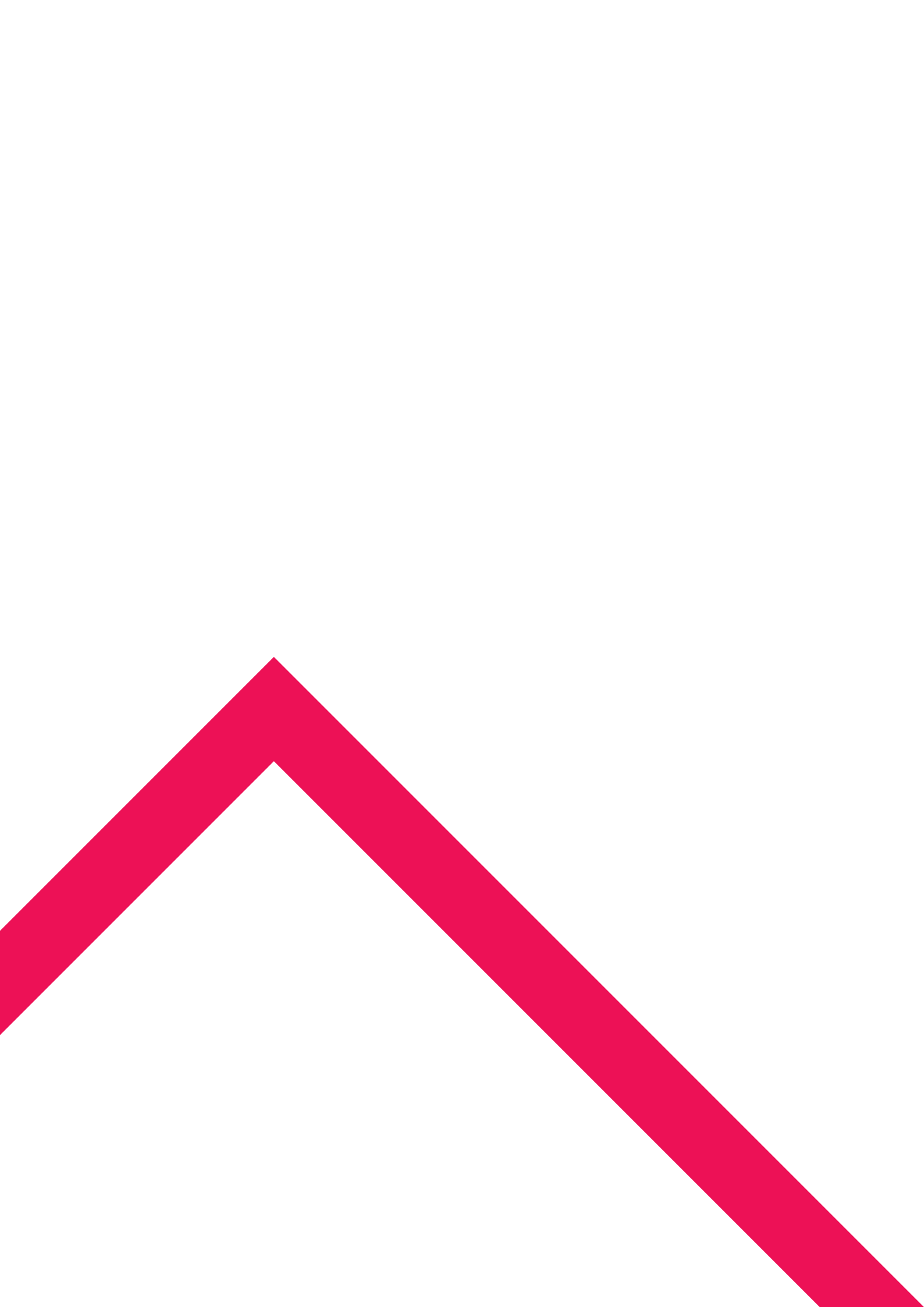
Ultimately, the NHS's greatest asset is its workforce. To unleash its potential, we must improve capability and capacity to support our innovators as well as promoting adopters of innovations. When we launched the NHS Clinical Entrepreneur Programme in 2016, I would not have dared to predict what our Clinical Entrepreneurs would accomplish with little more than a badge of permission and a safe space to innovate. Having just entered Year three, we have now recruited over 360 Clinical Entrepreneurs from across the front line and what they have achieved whilst still working in the NHS is remarkable.

The Long Term Plan for the NHS will set out the changes we need to see in the way we deliver healthcare over the next 10 years. I am confident that innovation will be a key enabler in making it a reality.



Professor Tony Young, National Clinical Lead for Innovation, NHS England

1. <https://www.england.nhs.uk/publication/nhs-englands-research-needs-assessment-2018/>





ABHI

Association of British HealthTech Industries
107 Gray's Inn Road
London, WC1X 8TZ

A company limited by guarantee.
Registered in England no. 1469941. Registered office as above.

+44 (0)20 7960 4360
enquiries@abhi.org.uk

www.abhi.org.uk

 [@UK_ABHI](https://twitter.com/UK_ABHI)