HALSTON B2B

MEDTECH +HEALTHTECH

THE NEW REALM OF PATIENT CARE

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PREFACE

Innovation has forever been the core of the healthcare industry. In the 21st century, we are in a new era of healthcare with the introduction of revolutionary technology. The new wave of innovation that is sweeping the sector is paving the way to greater patient care alongside empowering patients to own their care.

Industry titans and emerging start-ups alike are navigating this new world, striving to be at the forefront of the industry. But are they bringing their patients along with them?

This paper will look to investigate the emerging innovations and complex challenges of the new world of MedTech and what the future holds for the industry.

From all of us at Halston B2B, we hope you enjoy reading this article.

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THE CREATORS

This paper was created by **Jessica Farrow**, **Antonia Gifford,** and **Evie Highley**, and contains expert thought from those in the sector.



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Halston B2B has brought together an extensive range of expertise to deliver first-hand insight to the paper.

ELEMENTAL HEALTHCARE

Adam Levick, Group Marketing Manager

Founded by a pioneering Laparoscopic Surgeon, Professor Mike McMahon, they design, manufacture and distribute globally, a comprehensive range of surgical instrumentation and implants for Minimally Invasive Surgery. Based from their UK headquarters in Leeds, Elemental Healthcare employ over 100 people as part of their global operation and within their UK subsidiary, Elemental Healthcare, a dedicated team of 15 people serving the UK and the NHS specifically. In 2022 the Group celebrated its 30-year business anniversary.

COGNITANT

Tim Ringrose, CEO + Alex Merckx, Director of Marketing & Partnerships

Cognitant is a global provider improving patient outcomes through personalised, patient-centric health information and experiences. Their platform, Healthinote, is the UK's leading patient learning platform. It provides people with trustworthy, easy to access information and training about their health so that they can manage their own health more
effectively.

KINSETSU

Ken Moran, Business Growth Director

Kinsetsu creates intelligent tracking and locator solutions for healthcare and a range of other sectors - including the defence, local government, and tourism industries. With a technology agnostic approach, it implements IoT solutions based on its core platform, ktrack.

TECHUK

Julian David, techUK CEO + Alex Lawrence, Programme Manager, Health & Social Care

techUK is the trade association which brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. With over 800 members (the majority of which are SMEs) across the UK, techUK creates a network for innovation and collaboration across business, government and stakeholders to provide a better future for people, society, the economy and the planet. By providing expertise and insight, they support members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

MEDICALCHAIN & MYCLINIC

Dr Abdullah Albeyatti, CEO of Medicalchain

Medicalchain is focused on empowering patients to have access to and control their medical records. And MyClinic is a telemedicine solution which is used worldwide in over 78 countries around the world.

NEXUS (UNIVERSITY OF LEEDS)

Dr Martin Stow, Chair and Director

Nexus is a vibrant community that helps turn big ideas into reality, whether developing a new product or growing a successful business. The Nexus community comprises high-growth businesses across the globe and has a physical base in a state-of-the-art innovation hub on the University of Leeds campus.

NEURONOSTICS

Yolanda Hill, Business Development Manager

Neuronostics use the power of mathematical modelling to develop novel digital biomarkers to create faster paths to diagnosis and effective treatment for neurological conditions. Our EEG-based digital biomarker for epilepsy, BioEP, can support diagnosis without observing rare signatures of seizures on the EEG, expediting the diagnostic pathway. BioEP also provides an objective indication of response to treatment, facilitating finding the right treatment option for a particular person. We hope the use of our technology will improve the lives of people living with or affected by neurological conditions.

PANAKEIA

Dr Pahini Pandya - Founder,CEO

Panakeia deliver next generation multi-omics and biomarker profiling directly from routine tissue images. Panakeia offers reliable results in minutes, entirely digitally rather than executing multiple chemical tests over several days or weeks.

YOURMEDS

Dr Nitin Parekh, Director

YOURMeds is a smart medication system that supports people to take the right medication at the right time. It creates a circle of care around an individual underpinned by technology and behavioural psychology. YOURMeds technology is built to minimise digital exclusion, have maximum simplicity at point of use, and work seamlessly within existing care channels.

PAGE WHITE FARRER

Virginia Driver, European Patent Attorney, and Director

Page White Farrer provide intellectual property strategy and protection from experienced European patent attorneys and trade mark attorneys. With offices in the UK (London and Leeds) and Germany, their attorneys are experienced in all aspects of intellectual property law, with clients ranging from multinationals to start-ups.

INOVUS MEDICAL

David Rawaf, Clinical Excellence Lead

Inovus Medical is a manufacturer of surgical & medical simulation technologies. Their purpose is to improve surgical care through connected surgical training. They are a mission led company: aiming to become the world's partner for connected surgical training, channelled via core values of accessibility, affordability, and functionality.

CLARION

Christian Hellmund, Partner, Energy & Sue Streatfield, Partner, Intellectual Property

Clarion provide legal advice, commercial sense and know-how to help clients plan for, and protect their business', with substantial experience across the life sciences and healthcare sectors.
Clarion support innovation across the MedTech and Healthtech space with expertise within STEM and specifically bio-sciences sectors firmwide. They have a wide range of clients across the entire chain including universities and research facilities, uni spin-outs, pharmaceutical organisations, medical device manufacturers, suppliers, distributors, designers, importers and exporters.

THE DATA SHED

Ed Thewlis, CCO

The Data Shed is an award-winning data consultancy specialising in data transformation projects, single customer views, managed support services, and more.

Focused on driving value and insight, they create technical solutions with a product-agnostic approach and enable their clients to get the most out of their data and make better-informed decisions.

NIHR SURGICAL MEDTECH CO-OPERATIVE

Vee Mapunde, Programme Director

NIHR is committed to funding health, public health and social care research that leads to improved outcomes for patients and the public, and makes the health and social care system more efficient, effective and safe.

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WHAT TO EXPECT

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01 INTRODUCTION

Healthcare has always been one of those industries that innovates and continuously improves to deliver superior patient care and experience. Whether it's redefining surgery to become minimally invasive or driving new personalised medicine in cancer treatment. The need to reinvent has always been accompanied by a parallel innovative drive in the MedTech field.

The ramifications of the past few years have amplified the need for MedTech and HealthTech in one respect, but also intensified pre-existing barriers, making the movement towards digital a complex landscape to navigate.

In this paper, we want to gain a grasp of what is currently happening in the industry, delving into the emerging technology but also the competition level, adoption rates and investment. Beyond this, we want to investigate the potential of MedTech and HealthTech when applied in the field, with a particular focus on patient care and how if adopted, implemented and interoperable with the wider clinical pathway then it could revolutionise the care patients receive.

To achieve this insight, we spoke to leaders in the MedTech and HealthTech fields to learn about their ground-breaking technology that are reimagining current practices but also learn first-hand what struggles they are facing in terms of adoption, and even hear predictions on what the future of healthcare could look like.

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02

MEDTECH OR HEALTHTECH

Now before we go any further, we must define the difference between MedTech or HealthTech. Whilst they are connected and sometimes used interchangeably, there are core differences that we must outline.

HEALTHTECH

HealthTech is focused on prevention, and focuses on improving the delivery of patient care. It encompasses devices that monitor and measure peoples individual health metrics and often offers feedback surrounding the results. It includes the likes of telehealth, wearable items or remote monitoring. Most of the technologies try to minimise the time in which people spend in hospitals or visiting doctors. However, there are some technologies beyond this that are orientated around the critical back office operations that determine patient care effectiveness, these are typically platform-based software and could optimise the likes of patient records, staff scheduling or room booking.

MEDTECH

On the other side, MedTech is more focused on technology-based apps or devices that are predominately used within a hospital environment. The focus of this technology area can be so much wider, including the likes of treatment, diagnosis, patient care or overall health improvement. It can be digitally-enabled equipment, software or devices. Some of the improvements of utilising MedTech could be faster or more accurate diagnosis, increased success rate in surgeries or even make them less invasive, thus minimising recovery time for patients.

Whilst they may have separate definitions, there is a core topic that unites the two. Patient care. These technologies are looking to build a better future in healthcare;

- ✔ ONE THAT IS PATIENT-CENTRIC
- ✔ ONE THAT IS NOT CONTAINED TO THE FOUR WALLS OF A HOSPITAL
- ✔ ONE THAT IS FAIRER AND MORE ACCESSIBLE
- ✔ ONE THAT IS PROACTIVE
- ✔ ONE THAT LEADS TO IMPROVED PATIENT CARE

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03

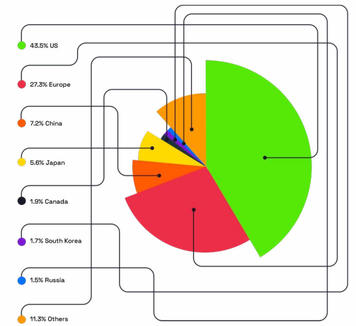
THE MEDTECH MARKET

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HealthTech & MedTech is our past, present and future. However, the technology in the field is advancing at a rapid pace and unlocking a host of incredible opportunities.

Due to this, the MedTech market is constantly evolving. from the first discovery of the stethoscope to today, where augmented reality is being introduced to surgical care. Now there are thousands of MedTech solutions being developed to address a plethora of challenges in the healthcare industry.

DIAGRAM 1: WORLD MEDICAL DEVICE MARKET SHARE



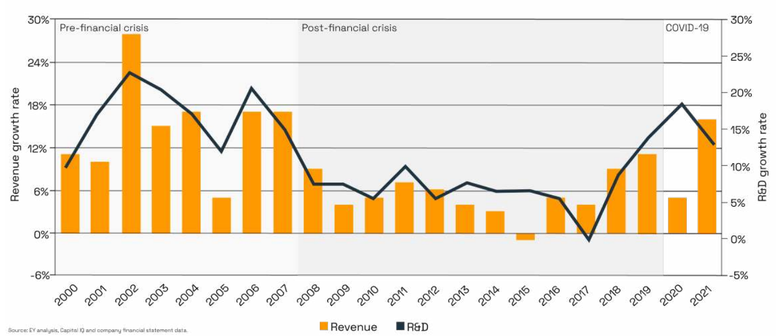
Source: MedTech Europe

The world of MedTech & HealthTech is expanding and devices are being derived from the four corners of the world. However, according to MedTech Europe data, the US is leading the way, holding 43.5%[1] of the market share, followed by Europe, and then China.

The European and US medical technology industries have performed remarkably throughout the Covid-19 pandemic, which some in the sector have considered to be the 'peak' of adoption, as the direct impact subsides, MedTechs will be faced with a host of other economical impacts this year.

The industry recorded a 16% revenue growth[2] in 2021 and a double-digit increase in R&D spending; a healthy sign to continue innovating and hopefully this could lead to continued growth in the coming year. The industry's revenue surge in 2021 extended across all product classes. Therapeutic devices – by far, the largest segment – grew 10%[2], with the five leading therapeutic areas (orthopaedic, cardiovascular, dental, ophthalmic and women's health) all increasing their revenues by at least 16%.

DIAGRAM 2: MEDTECH GLOBAL REVENUE



Source: EY

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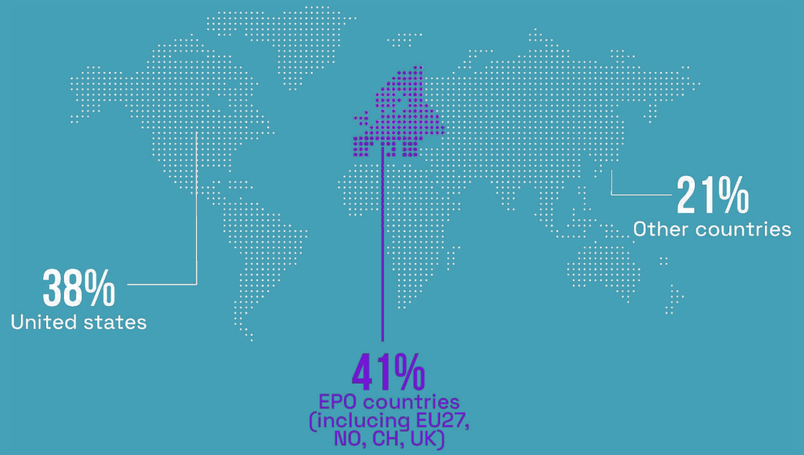
3.1 PATENT APPLICATIONS

A rise of patents being filed demonstrates a rise in innovation, with both new products and companies entering the field.

In 2021, more than 15,300[3] patent applications were filed with the European Patent Office (EPO) in the field of medical technology, representing a 0.8% growth in patent applications compared to the previous year. The patents haven't all just originated from European countries either. A strong proportion of the patents filed stemmed from countries outside of Europe, with 38% being US-based MedTechs.

The medical technology industry is vast, with thousands of innovations already being applied to health systems across the globe. To be able to deliver constant advancements, the industry continues to put investment and profit back into research, with the average global R&D investment rate as a percentage of sales estimated to be around 8%[1].

DIAGRAM 3: PATENT APPLICATION IN MEDTECH FILED WITH EPO IN 2021



Source: MedTech Europe

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3.2 INVESTMENT

From 2020 to 2021 the industry was a buzz with new innovations, deals and investment.

288 M&A deals were executed

94% of leaders reported improved revenue, up a collective 30% increase compared to 2020

IPO funding grew by 100%, generating $6.4 billion

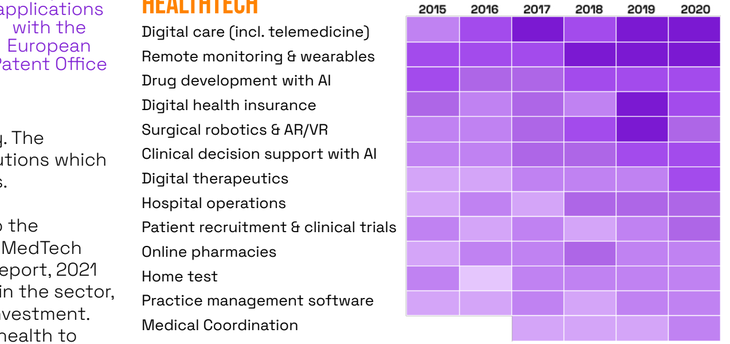
In 2021, 15,300 patent applications with the European Patent Office

Diagram 4: MedTech Growth in 2021. Source: EY

The investments are not only being driven internally. The financial sector is fiercely investing in MedTech solutions which are expected to perform well over the coming years.

More and more venture capitalists are stepping into the MedTech market, leading to a greater proportion of MedTech start-ups being invested in. The Digital Healthcare report, 2021 showed both a growth in the overall value invested in the sector, but also a rise in the range of segments receiving investment. The diversification of investment grew beyond telehealth to segments such as wearables, AI & digital therapeutics.

DIAGRAM 5: VENTURE CAPITAL INVESTMENT ACTIVITY IN HEALTHTECH



Source: Sifted.eu

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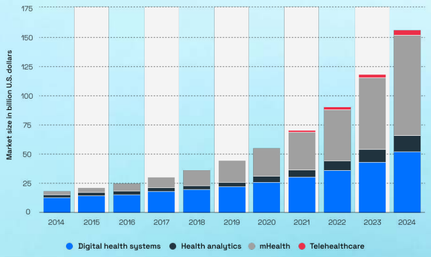
3.3 REGIONALITY

US

The US has held a foothold over the MedTech industry for years, being home to industry titans who have led the field, especially when it comes to medical devices. However, the divisions within MedTech are growing year-on-year, as innovation continues to grow and more money is fed into research and development.

The direction in which the industry is moving is constantly shifting. For example, digital health systems[4] held the greatest proportion of the market share in the US, but the latest predictions expected a movement towards mobile health and this is expected to rapidly grow over the next few years.

DIAGRAM 6: MARKET SHARE IN MEDTECH



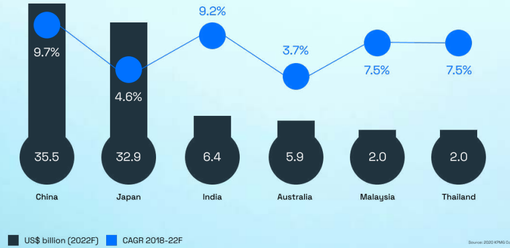
Source: Statista

ASIA

MedTech in Asia is booming and is being very much driven by a rapidly growing population. It is predicted that over 60%[5] of the world's population will be living in Asia by 2030 with one in four people over the age of 60, accounting towards an ageing demographic as well.

The APAC medical device landscape is evolving, but due to the disparity in regions' access to healthcare, the greatest proportion of growth is driven by China. Aside from the population changes, the government's interventions to simplify the regulatory system for overseas investors alongside policies to expedite the approval process for innovative products have been key enablers to the growth of the MedTech market.

DIAGRAM 7: MEDICAL DEVICES IN APAC



Source: KPMG

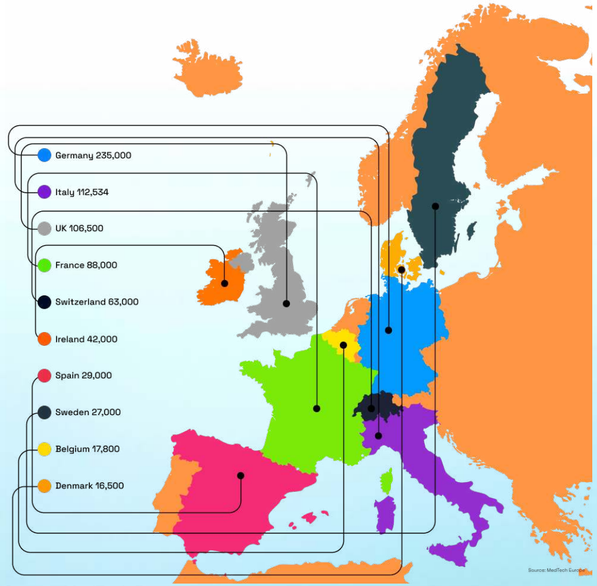
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EUROPE

In 2021, the European MedTech market was valued at €150 billion, 27.3% of the world's market share. To add to this, European MedTechs directly employs more than 800,000 people.

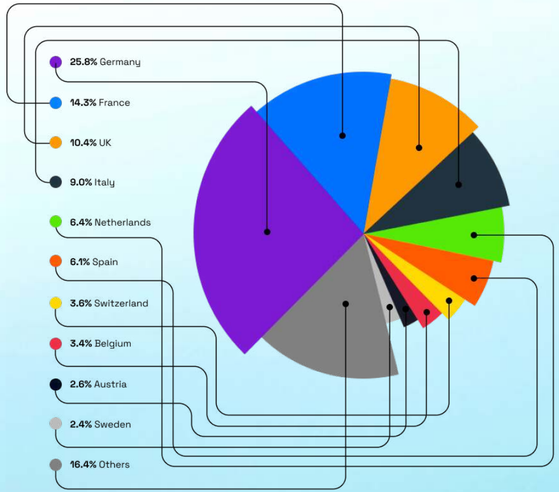
Across Europe, there are more than 500,000[1] medical technologies available in hospitals, community care settings and at home. A proportion of which are being delivered by 34,000[1] medical technology companies in Europe, and SMEs make up around 95% of these, indicating a level of maturity for the technology that exists.

DIAGRAM 8: TOP 10 COUNTRIES IN EUROPE



Source: MedTech Europe

DIAGRAM 9: EUROPEAN MEDICAL DEVICE MARKET



Source: MedTech Europe

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04

THE UK MEDTECH MARKET

Drilling down to what is happening here in the UK, the medical technology sector generates an annual turnover of approximately £30 billion each year which has been built on a strong foundation of small to medium-sized companies situated in clusters in key regions, such as the South East of England.

Operating a very different structure to other countries in Europe with a predominately free healthcare service, which alters a MedTechs approach and the competition landscape. Unsurprisingly the NHS is the largest purchaser of medical technology, accounting for approximately 85%[6] of the country's healthcare provision.

"The UK has one of the largest medical technology industries in the world and is one of the leading countries in terms of research capabilities, linked strongly to universities. The NHS encourages the testing of innovative technologies within the organisation and there are plenty of research grants available in the country, providing a strong setting for innovation to flourish. Equally we are seeing excellence in healthcare innovation from all corners of the globe and have excellent experience of working with innovation hotbeds in the US, S America and the EU. Great innovation is achieved when best practice is shared across borders."

Tim Ringrose, CEO of **Cognitant**

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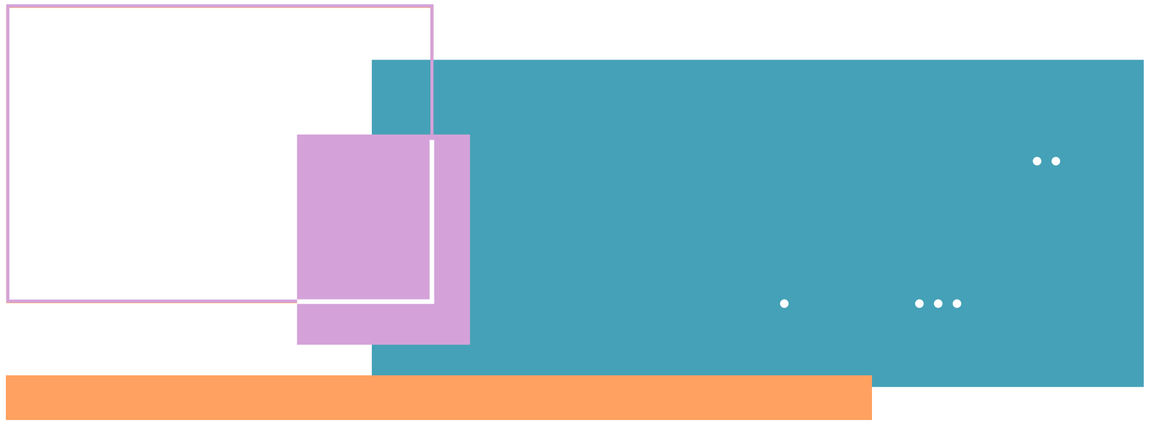
4.1

NORTHERN MEDTECH

Whilst the South of England has very much been the centre of the UK MedTech scene, there are now innovation hubs emerging across the country to expand our expertise and harness knowledge and innovative thinking from entrepreneurs across the UK.

"I think there's a lot going on digitally, but I do think that Brexit is a problem as it's caused a lot of uncertainty about funding for further development and research. From a regulatory point of view, we've now got a split in terms of getting regulatory approval for medical devices and software. So, you now have to comply with UK regulatory laws and EU regulatory laws which can diverge, causing problems for businesses both in terms of significant additional cost and administration. So, I think there's some great development work going on but the recent consequences of Brexit and the uncertainty with the economy are dampening things. The lack of uncertainty discourages investment."

Sue Streatfield, Partner, Intellectual Property, **Clarion**



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4.2

LEEDS MEDTECH SCENE

Being our home and a member of the tech scene, we felt it was imperative to showcase the technology arising here. Leeds has a deep-rooted heritage in the healthcare industry, being home to leading Universities, teaching hospitals and NHS Digital.

It's already home to the Centre for HealthTech Innovation[7] a joint research initiative between the University of Leeds and Leeds Teaching Hospitals NHS Trust to accelerate the development and adoption of new health technology, pioneering a 'participatory approach' to create medical devices to make them more accessible to low and middle income countries.

Initiatives such as these are looking to propel the industry forward, developing greater and more inclusive health care.

As an active member in the MedTech field, working with MedTech's and Trusts in the region, we spoke to Ed Thewlis, CCO of The Data Shed about his thoughts of innovation here in Leeds.

"MedTech innovation has been driven in Leeds for a number of years now. Look at things like NHS digital, the businesses in the region, and national bodies. But one of the things we are really seeing, especially with the likes of Nexus, is infrastructure and innovation hubs to support the growth of innovation and help entrepreneurs transition from research into commercialisation. This is really starting to take off. We've got some great capabilities, not just in terms of the knowledge and expertise in the region, but all of the supporting structures around it that have started to grow over the past five years."

As mentioned by Ed, Nexus is a central part and champion of the healthcare sector in Leeds, so it was crucial that we spoke to Dr Martin Stow to understand how they foster collaboration and what Leeds is doing differently.

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"Leeds is a thriving cluster for MedTech and Digital Health. It's home to two large hospitals and world-leading universities, and venture capital investment in Leeds tech start-ups and scale-ups has increased 88% year-on-year. A large part of the city's success has been learning to bring various parties together and ensure they are all pulling in the same direction.

Over the past five years, we have collaborated with a range of stakeholders to create a collaborative, engaged MedTech environment. Today, universities, Nexus, corporates, hospitals and local councils are on the same page, and it's a great place for start-ups and scale-ups. Nexus has helped make these connections and today it's easier than ever to make connections, carry out clinical trials, and navigate the ecosystem.

Part of this is the availability of expertise and assets – we have outstanding clusters focused on orthopaedics and digital health, with leaders in the convergence between AI, machine learning, analytics and health."

Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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4.21

FOSTERING INNOVATION IN LEEDS

A core aspect of what Nexus delivers is offering MedTechs and HealthTechs continued support in all its forms to foster innovation from those who aspire to be crucial tech to the market.

"The Nexus community comprises high-growth businesses across the globe and has a physical base in a state-of-the-art innovation hub on the University of Leeds campus.

Nexus and the University of Leeds, with our close working partnership with Leeds Teaching Hospitals NHS Trust, provide MedTech innovators with world-class facilities and equipment. With access to the university's expertise in medicine, biological sciences, data and analytics, health thinking and a full range of facilities at their fingertips, start-ups can quickly advance from idea to research, testing, and roll-out.

Nexus brings together the brightest minds from business, tech and academia. Our community and networks include innovators, UK-based MedTech funders, research and innovation experts, and successful entrepreneurs.

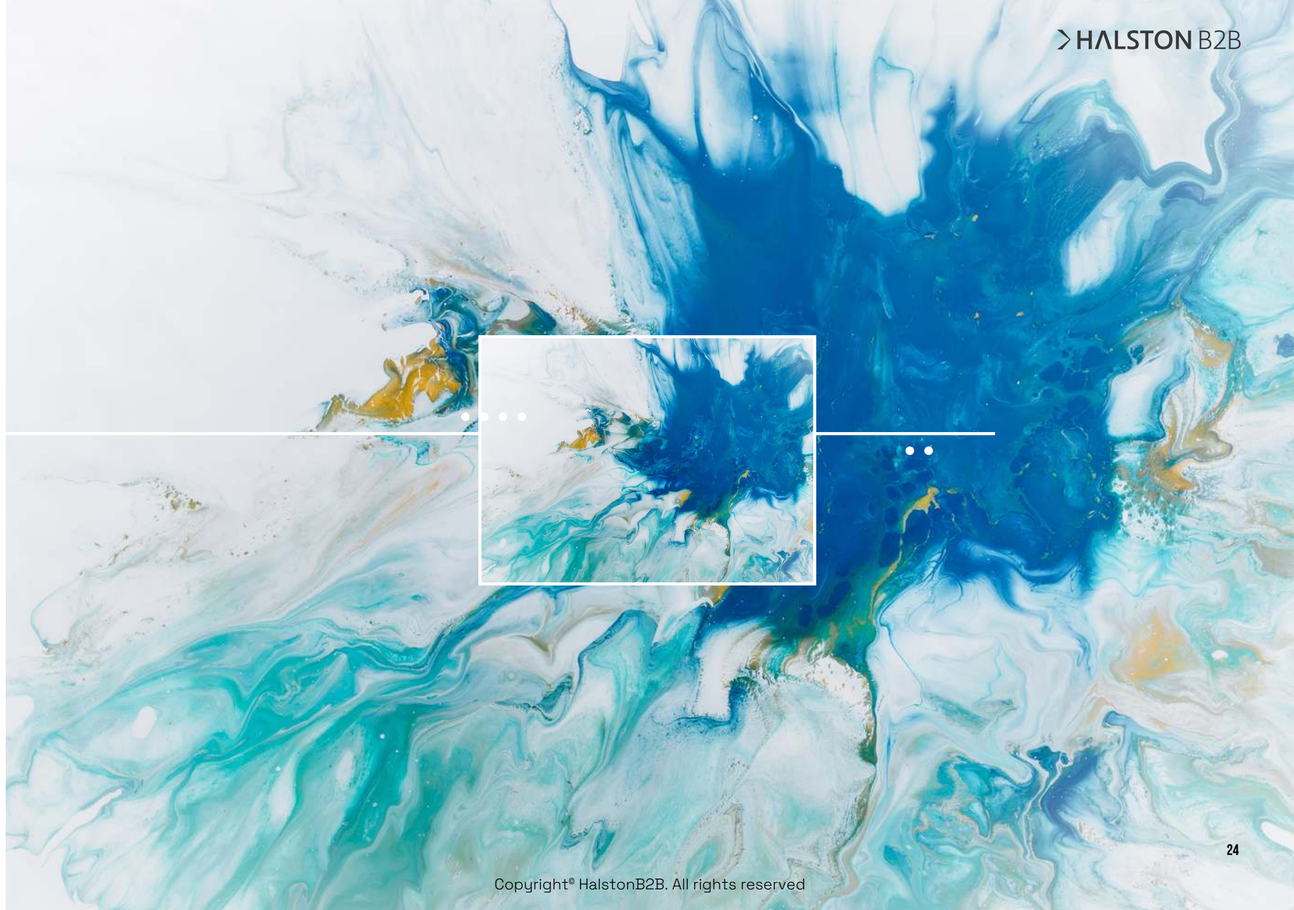
In short, Nexus accelerates both the medical and business considerations for MedTech start-ups and scale-ups by providing a supportive environment with ready access to expertise and resources. This helps bring their technology to market sooner and, ultimately, helps people live longer, healthier lives.

Our dedicated team builds upon this foundation by providing dedicated support. We help MedTechs identify, where they are, where they fit into the market, and what they need to do to get their tools into the hands of medical professionals.

The university base is ideal because it gives us access to experts in a range of fields. For example, we can connect MedTechs with social science experts to discuss how to use a patient-centric approach during technology development, or ensure their solution works with patient pull.

We maintain close ties with professional service partners, and we also work closely with Leeds Academic Health Partnership (LAHP) and the Yorkshire & Humber Academic Health Science Network (YHAHSN) to help maximise a MedTech's reach.
Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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05

CHALLENGES FACED BY MEDTECHS

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5.1

GROWING COMPETITION

Whilst the MedTech field has been dominated by those major players in the market, the tides are changing. More and more revolutionary MedTech start-ups are disrupting the market, with unique technologies that are out to address specific problems in the healthcare market.

Not only this, the innovation process has to be continuous to enhance products as new entrants enter the market, as according to research products typically have a life cycle of only 18-24[1] months before an improved product becomes available.

"It's a crowded market, MedTech's have small marketing budgets, and the target decision-makers are extremely busy, so driving awareness is a major challenge. Without awareness, even the best product will face adoption challenges.

Success here comes down to using marketing and sales resources effectively. The simplest solution is to partner with a sales or distribution network. They can provide an opportunity to ramp up sales quite quickly for a MedTech that starts out without a brand or reputation.

MedTech's also need to consider that the UK may not be the ideal market for their product and that it may be best to start by launching the product internationally. Businesses often come into the NHS and feel that they've cracked it – but it's not always as easy as that. It all depends on the product, cost, and where it fits into the treatment pathway."
Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**



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5.2 TIME TO BUILD A BUSINESS

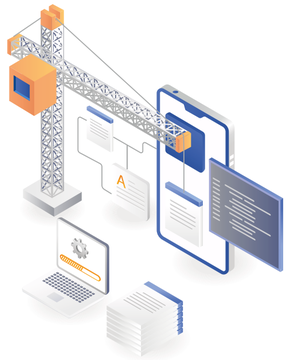
A common problem faced by many entrepreneurs is the time to innovate, and this becomes an even more pressing issue when it comes from a clinical setting. It could be argued that those best positioned to innovate medical technologies for healthcare, are those who work or have worked in clinical settings and have personally faced the challenges that need to be addressed.

Therefore, time to dedicate to building a MedTech and HealthTech business is crucial if we want to develop the best solutions for the future of healthcare.

Dr David Rawaf's passion for this topic has led to him collaboratively starting an initiative to support innovation in the NHS.

"I have assisted in setting up a Workforce Strategy Committee with key players from the Association of Surgeons in Training, Royal Colleges, General Medical Council, Health Education England and NHS Federation.

They're trying to create an integrated innovation training pathway which is essentially an opportunity to allow doctors and surgeons to take a placement away from their usual cycle of rotational placements and have a four-to-six-month period either learning from a company in the industry or trying to set up their own company, which is itself ideally a solution to a real problem faced by the NHS. It means that surgeons or doctors don't have to quit their training jobs entirely to create solutions or learn from the industry, meaning we retain staff but also allow them to innovate because, in reality, the innovations of the future need to come from those on the front line."



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5.3 EXPANDING KNOWLEDGE

Many MedTechs are founded by pecialists who have created a brilliant idea, and more often than not have come from a clinical background. Despite their extensive knowledge of the healthcare market and its needs, these entrepreneurs may not have experience working across the likes of regulatory or financial.

"As members of the Nexus community, businesses have access to our network, and we can help to facilitate these conversations and find where there may be a suitable collaboration, and where skills are complementary.

Our community includes people who have lived every aspect of MedTech, from developing ideas to securing grant funding, working with the NHS, and launching an idea overseas. We are dialled into the UK health tech funding landscape, and can offer advice to help start-ups and scale-ups wherever they are on their journey.

Due to our base at the University of Leeds, we also work closely with academics within the university. Therefore, our members can benefit from this expert knowledge and key research, which may impact how they develop their products or where the target market may be. We maintain a close partnership with the Leeds Teaching Hospitals NHS Trust based on our shared commitment to developing healthcare solutions for the 21st century."

Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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5.4
WHERE TO FOCUS ATTENTION

The areas and applications in which MedTech innovation covers today is truly extraordinary, but whilst there may be hundreds or even thousands of technologies available, for the innovation to be adopted there has to be a need from healthcare providers and often companies don't have the awareness of what hospitals or GPs are requiring.

Vee Mapunde, Programme Director at NIHR Surgical MedTech Co-Operative gives an example of an application area that needs to be addressed in the NHS surgical division.

"When it comes to surgery, what everybody is familiar with is waiting lists and not being able to get surgery when you need it. There is obviously a space for innovation that addresses the waiting list side of things. But more importantly for surgeons, waiting lists can also be eased with technologies that can help them decide the best treatment path for patients, to avoid multiple rounds of surgery and minimise the chance of post-operative complications. If you can prevent patients from undergoing multiple surgeries then you can minimise all of the associated complications."

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5.5
LEGAL PROTECTION

For technologies to be adopted, they need to provide value and that value needs to be protected for the longevity of the solution. However, legal protection is often something MedTechs can see as a challenge and founders may not be fully aware of how and when to protect their innovation.

"A lot of companies make the assumption that their innovations are not patentable, so they never even ask basic questions. I also think that there's a perception that patents are very expensive, but, in the initial stages of patent protection, it's actually quite cheap. It only becomes expensive if you start getting 10s or hundreds of patents.

Very often MedTechs wait until they're asked if they have a patent by somebody else before they pursue it. We especially see this when a small company takes its MedTech to a larger company, with nothing in place to protect them and their products. One thing that is important to understand is you can only file a patent application if you have not already disclosed your invention. As soon as your invention is out there, the opportunity to file a patent is gone.

Another requirement of the patent system is that you provide what's called an enabling disclosure, which is a full description of what you're doing. So if you're trying to protect AI for example, you need to have the technical purpose laid out in your patent application document. This is especially important as you have limited opportunities to amend the application once it's written, so it's important to get it right the first time."
Virgnia Driver, European Patent Attorney, and Director of **Page White Farrer**

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06

THE VALUE OF MEDTECH

Appropriate and widespread utilisation of medical technology has the potential to improve health outcomes. We spoke to our contributors to understand what they believe innovation and the adoption of MedTech and HealthTech is able to deliver in the sector.

The past several years have certainly been a catalyst for the adoption of digital technologies in the healthcare sector, yet there is always progress to be made to build a more resilient healthcare system.

We wanted to hear from our experts as to why they believe the implementation of MedTech is a critical component of healthcare's journey.

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"The healthcare sector is overwhelmed at a global level, facing unprecedented demand and severe operational pressures that can only be addressed by changing the status quo and embracing technology as a critical part of the solution.

With a life expectancy of about 81 years, we are living in a rapidly ageing population. The Office of National Statistics has said that by 2035, 25% of the world's population will be in the over-65 cohort. Meanwhile, the number of older people diagnosed with four or more chronic conditions will double between 2015 and 2035.

On an average day in the NHS, more than 1 million people attend a GP appointment, restricting the consultation time to an average of 9 minutes[8]. Waiting times for operations and procedures are long: in the UK 6.7m people are now on a waiting list, many of them with life-threatening conditions such as cancer. Clinicians are increasingly frustrated with the limited health support they can offer, with many leaving the profession. At Cognitant we believe that technology can play a major role in optimising consultations and care pathways, delivering better and more targeted care and supporting preventative care through a more empowered patient who can make better decisions about their own health and manage their health conditions more effectively.

Technology needs to be at the heart of how health services are transformed, radically rethinking how health is maintained and care is delivered".
Alex Merckx, Director of Marketing & Partnerships, **Cognitant**

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“Adoption is crucial. We focus on the desired outcome before technology, and for us, that will always remain true. Innovation is crucial in healthcare, but this mustn’t be limited to technology – rather a constant thread right throughout the healthcare industry’s entire culture, not just its procurement and IT divisions.

For us, true innovation in healthcare means adopting the ‘right’ technology to best deliver outcomes for patients, staff and wider societies.”

Ken Moran, Business Growth Director, **Kinsetsu**

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06 THE VALUE OF MEDTECH

“Digital transformation is not a ‘nice to have’ for our health service, but a fundamental pillar that we must have in place in order to tackle the challenges of an ageing population, an estimated elective care backlog of 6.5 million[9], and a social care sector facing serious staff shortages. Digital transformation creates much needed efficiencies for NHS staff, freeing up their time and resources for patient care, and enabling data sharing across systems that will allow the UK to adopt the population health approach set out by Government. It has never been more important to digitise and modernise the way the UK provides care, and we cannot afford to slow down now.”

Julian David, CEO, **techUK**

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"I think that the healthcare sector adopting new, innovative technology is important for its survival. We're now seeing how budgets for healthcare are being slashed. Our nursing colleagues and ambulance services are about to go on strike, and rightly so. Using technology will allow us to be more efficient with the resources that we have available to us. But there needs to be an intelligent way of doing this rather than what we've seen so far, for example, COVID-19 track and trace was a total waste of money. People would argue that that was us adopting technology, but it didn't need to be done for that program. Actual adoption of technology, however, is vital for survival, it's as simple as that."

Abdullah Albeyatti, CEO of **Medicachain and MyClinic**

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06 THE VALUE OF MEDTECH

"The "third industrial revolution" and the advancement of digital technology in healthcare are the keys to overcoming long standing issues like health care inequality, long wait times, and overstretched staff. The Covid-19 pandemic has drawn attention to the importance of an agile, well-equipped global healthcare system and this period also demonstrated how quickly things can be done when needed.

Unfortunately, the pandemic also placed significant additional pressure on the system. A key way to address the NHS's huge financial challenges is to introduce new innovative approaches and technology to help support its processes. In the UK, for example, the NHS has record waiting times for many essential procedures. NHS staff are doing incredible work under enormous pressure, so we need to look at solutions that support them.

It's time to invest and roll out solutions – from prevention, screening, monitoring and diagnosis to treatment – to drive greater efficiency, and technology can be the key. Tech can also enable new ways to deliver healthcare, such as remote screening and real-time monitoring. The social care sector faces many of the same issues as healthcare more broadly and can utilise many of the same technologies to address them."

Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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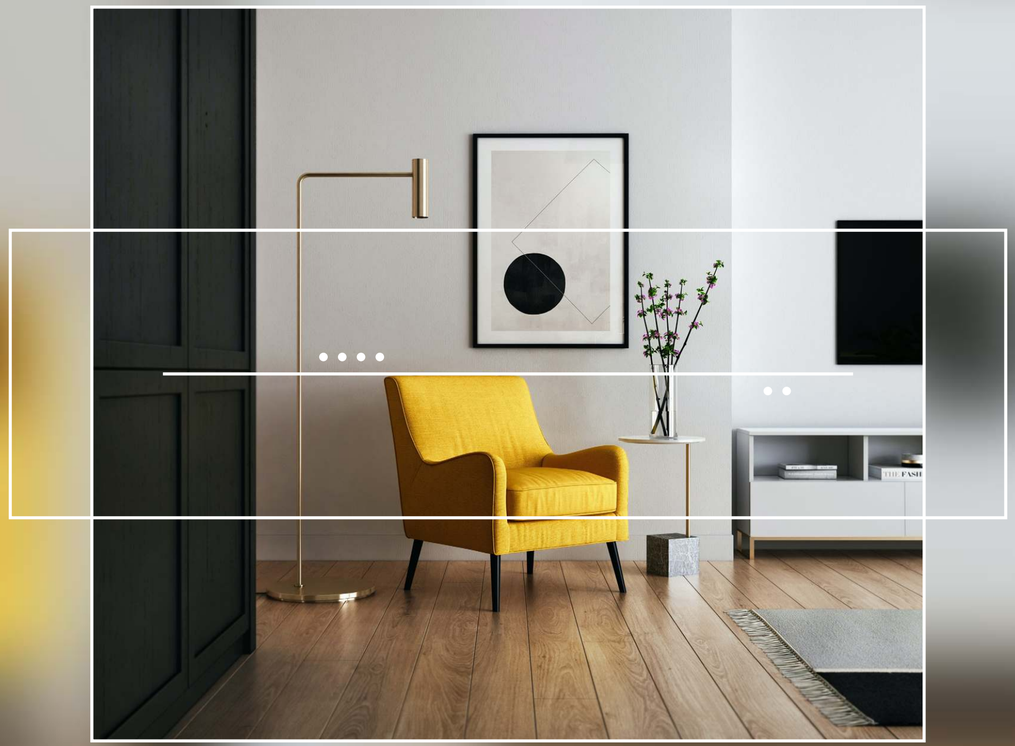
“Hospitals are increasingly struggling with capacity and waiting lists are getting longer. When resources are squeezed, it’s time to look at system efficiency and find new solutions to decrease pressure on the service. Significant interest is being shown in medical technologies which focus on providing care in out-of-hospital settings. These range from technologies for pre-screening, triage and diagnosis, through to monitoring conditions, either by health-care professionals or patients themselves. These technologies will play a vital role in enabling the people who urgently need care in hospitals to receive it, and those who are in less urgent need, to be monitored more efficiently.”
Yolanda Hill, Business Development Manager, **Neuronostics**

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“There are a lot of solutions to common everyday problems, whether it be training or patient care. As long as the solution is there to address an actual problem, that’s fantastic, otherwise we are simply re-inventing the wheel. There are plenty of institutions that are investing in creating their own HealthTech solutions or programs when one already exists. The positive side to all this innovation is that these solutions can actually have a tangible impact on doctors’ time, which can be allocated to both training and patient care. With an ever-growing ageing population that has increased pressure on the NHS at an exponential rate, we need the solutions to manage these kinds of workloads with a similar if not smaller workforce.”
Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

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“As the cutting edge is developing so quickly, if you don’t keep up and continuously push boundaries your technology will become redundant. MedTech is hugely important for the economy and also for the benefit of the people that are using that technology. Better technology should improve our experiences of health services, especially for those that are more vulnerable. Advancements in technology should help health services become more efficient. For example, the ability to monitor someone in the comfort of their own home allows for a hospital bed to be used for another patient in need.”
Sue Streatfield, Partner, Intellectual Property, **Clarion**



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07

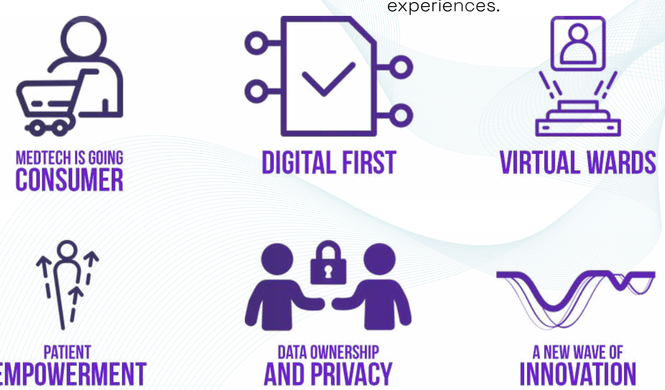
THE NEW REALM OF PATIENT CARE

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7.1 DIGITAL FIRST

Whilst there are hundreds of new incredible innovations that are entering the market each year, there is one element that is centric to each of them; patient care. Each of the technologies in either direct or indirect ways are improving the level of care that patients will receive. Healthcare institutions are looking towards a new model of care that is fundamental for an ever-growing population.

The diagram below demonstrates the core elements that are shifting in the industry and is underpinned by medical technology.



As healthcare organisations move along their digitalisation journey, there is a phrase that is becoming more prominent in the industry and that is 'digital first' which refers to a form of care that includes a patient's first interaction to be one that is digital, whether that be a virtual call or an app to book an appointment. The hope in which this digital first method aims to achieve, is a more streamlined, efficient system and one that delivers improved patient experiences.

In the NHS specifically, the Digital First Primary Care is a programme which supports the implementation of digital tools in GPs. Out of all of the factors that are changing in the industry, this is often the one most up for debate. The term in particular 'digital first' has come under scrutiny as should it always be the first option if that isn't necessarily the best option for all patients?

Whilst it is an ambition of the NHS' to become digital first, there are great leaps to be made to achieve this, such as the critical need for interoperability in records and systems and it has to bring all patients along on this journey or at least support alternative methods to deliver the same level of care.

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7.2

MEDTECH IS GOING CONSUMER

A far cry from the days in which MedTech companies were medical devices and sold directly to medical institutions, today the MedTech landscape is a whole new world. It is one that doesn't necessarily include a physical product and has brought the consumer into the sales flow.

In the rapidly evolving context of consumer-focused healthcare, MedTech is more and more considering the consumers involvement in their healthcare management. Now solutions consider;

- **where the tech will be utilised,**
- **how it can be accessed remotely,**
- **how it integrates with internal systems,**
- **how it can share data in a secure way or even educate patients on best practice for treatments.**

This coupled with more health conscious consumers means MedTechs are no longer just considering their clinician use, they are making functionality or even full devices purely for consumers, and in some scenarios they are looking to avoid the clinician setting altogether.

Some MedTechs are flipping the traditional go-to-market model on its head by selling directly to consumers who will use the technology to make more informed decisions and share accurate and detailed health data with their GP to help improve the diagnosis stage.

THE CHALLENGES

Working directly with consumers is definitely an interesting market within the MedTech and HealthTech fields, but there are many ethical points to be considered when you are essentially removing a trained clinician from the equation.

Neuronostics explains why at this point they would not go directly to a consumer.

"here is a lot of work being done on considering the ethics behind providing someone a risk score of future health conditions or events. In the case of epilepsy, providing someone with an indication of a high risk of seizures (for example via a score from our digital biomarker of epilepsy, BioEP) could be a self-fulfilling prophecy because we know that stress triggers seizures. Moreover, diagnostic decisions for epilepsy are based on a portfolio of clinical evidence, all of which need to be taken into consideration for an accurate diagnosis.

As a result, we don't plan to provide BioEP scores to people directly at the moment. Instead, we envisage the BioEP score being considered by the clinical care team to inform the management of their patients. We continue to conduct clinical trials and engage with people with lived experience of epilepsy, neurologists, neurophysiologists and epilepsy nurses to understand if the BioEP score could be used directly by people with epilepsy in the future."

Yolanda Hill, Business Development Manager, **Neuronostics**

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7.3

DATA OWNERSHIP & PRIVACY

In order to learn more about their health, people are more and more willing to provide access to data to HealthTech firms and even more commercial brands. A recent statistic showed that 35%[10] of consumers are willing to share data with medical device manufacturers and this increases to 56%[10] when sharing data to help with disease prevention.

In some respects this change in attitude could enable GPs/clinicians to have much deeper insight into patients' health. There is the question to be raised around data ownership and privacy. In the traditional format health data was specifically held by hospitals and GP surgeries in a secure on-site database, but now data could be co-shared with patients who could access it remotely on a mobile device, at any time, or a database not controlled and hosted by the NHS.

Dealing with such sensitive information, data security will remain a high priority in the move towards digital care.



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7.4
PATIENT EMPOWERMENT

As mentioned earlier, people as a whole are becoming more health conscious and more than that, they want to play an active role in their care.

"We know that people wish to be more empowered with knowledge about their health. 5%[11] of all Google searches are health-related and yet "Approximately half the population (51.3%, 95% CI 46.4-56.2)[12] of consumers seeking Web-based health information and living with chronic health conditions was estimated to have navigational needs," meaning they found it difficult to locate health information they needed to find on the internet. This is a challenge which really needs to be addressed."
Tim Ringrose, CEO of **Cognitant**

This involvement isn't just restricted to self-searches; they are wanting to provide more information in clinical settings to help optimise the outcome.

"I think people are definitely becoming more actively involved in their own healthcare. People are a lot more engaged with their GPs, they are understanding the system and how to speed it up. The challenge you really have is patients who don't know where to go next. You get patients that come to the GP that really should have gone to A&E and vice versa. And that moves you onto the point of how important the education side is."
Abdullah Albeyatti, CEO of **Medicalchain**

"From our experience of talking to people with lived experience of epilepsy, many wish to have greater involvement in their care, and part of the reason is to develop greater knowledge of their condition, perhaps feel "more in control", and to feel more supported."
Yolanda Hill, Business Development Manager, **Neuronostics**

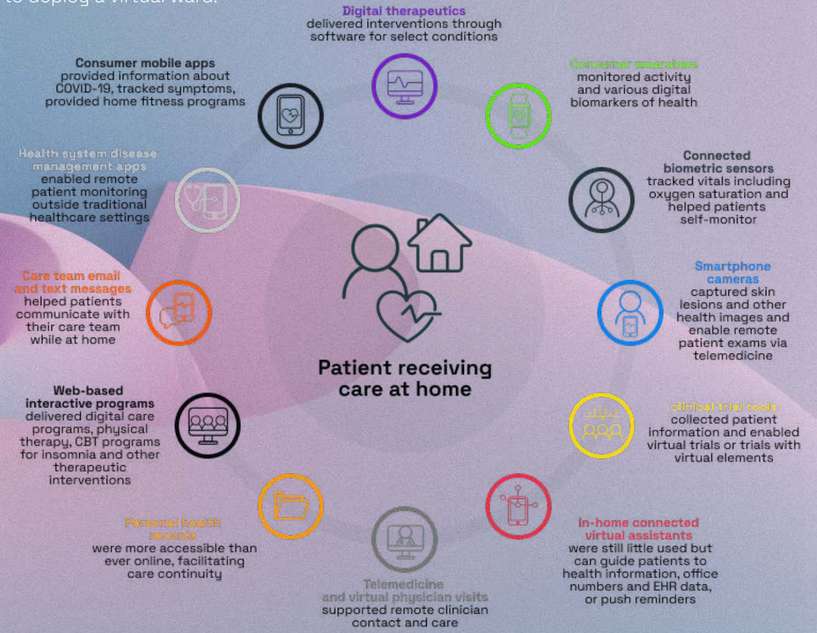
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7.5
VIRTUAL WARDS

Virtual wards have been very much thrust into the limelight in the past couple of years. Covid has been that turning point for this change for a multitude of reasons. It enabled a time for health practices to prioritise digital health and as we move into this recovery phrase the demand on resources becomes greater. For example, the NHS needs at least 5,000[13] beds to achieve safe bed occupancy levels and hit the four hour waiting time target. Alongside the clear need for additional resources, the time period in which patients are admitted needs to be minimised and the discharge process needs to become more efficient without of course jeopardising patient care.

Whilst it was introduced as a Covid practice, the concept of virtual wards has since expanded to other clinical pathways.

However virtual wards will not be possible without the adoption of multiple technologies. The diagram below demonstrates all the possible technological mechanisms to be applied to deploy a virtual ward.



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08

THE RISE OF AT-HOME PATIENT CARE

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Patient care is becoming a much more holistic concept, considering a patient's time both inside and outside of the hospital environment. Whether it is referred to as a virtual ward or hospital-at-home, the way that the healthcare sector is delivering care is vastly changing.

There has been a shift in the healthcare industry to deliver new models of care and our experts whose solutions underpin this model provide their opinions on if they see virtual wards becoming commonplace in the near future and what needs to happen to make home hospitals a reality.

8.1 THE POTENTIAL

"Soon people will receive much of their consultations and care from the comfort of their own home. This is already being seen with the trend towards telemedicine and virtual care. Indeed, during the pandemic, 96,000 people were monitored at home or within a care home, outside of the hospital setting. With the increase in innovation of devices that allow for remote monitoring of a patient, such as smart watches, mobile apps, wearables and video feeds, this will become more and more possible."
Alex Merckx, Director of Marketing & Partnerships of **Cognitant**

8.2 THE DRIVING FORCE FOR CHANGE

"At-home patient care was certainly accelerated by the Covid pandemic where remote consultations and some remote patient care was necessary. Clinicians and patients alike responded well to the opportunity to optimise consultations and reduce the need for patients to travel to hospitals and clinics, as has been the norm until now. This is not only more convenient for patients, but it improves the capacity of health providers and is of course better for the environment. Innovations such as the smart phone and other wearable devices have also promoted and improved peoples' self-awareness of their health and regular self-monitoring of vitals such as heart rate, oxygen saturation and respiratory rates."
Tim Ringrose, CEO of **Cognitant**

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8.3

TECHNOLOGICAL BACKING

To ensure the virtual care model is successful, the problems need to be highlighted and sensical solutions need to be implemented.

"There is a growing interest in monitoring outside of the hospitals. Speaking with customers, the concept of virtual wards and the home model are becoming greater but locating and retrieving assets back is already very difficult. As soon as the asset leaves the trust, the vast majority are not aware of where they are. Our technology delivers asset tracking data anywhere to locate and retrieve them and bring them back into the system. It does this whilst maintaining strong data protection procedures, as no personal data is stored when tracking assets outside of the hospital environment, only a longitude-latitude location."

Ken Moran, Business Growth Director, **Kinsetsu**

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8.4

THE SCENARIO

Virtual care of course is not for every clinical pathway but there are definitely scenarios in which this model could be applied. Our experts explore two scenarios in which virtual wards could be or are being applied.

SCENARIO ONE

“With NHS hospitals struggling with capacity and growing demands on health care services globally, at-home care is increasingly required to take pressure off hospitals. By supporting monitoring at home, we hope to speed up the path to reaching the optimal treatment strategy for a patient.

We are developing a solution to be used at home to record brain signals, which can be used by our BioEP algorithm. By calculating BioEP at home, this can inform the hospital about people that need urgent monitoring, who can then be expedited for further tests. BioEP can also help by providing an objective measure of treatment response. We know that anti-seizure medication is not always successful at controlling seizures and can have severe side effects. By using BioEP, we can help to inform clinical teams that a medication may not be working well for a particular person, and therefore, they can more rapidly change their medication to find one that works better for that person. Careful monitoring of people with epilepsy is important, not only because seizures have a significant impact on quality of life, but they are very dangerous and can be fatal. Epilepsy is the single largest cause of neurological admissions to A&E departments, so by more consistent monitoring at home to support faster paths to better treatment protocols, we hope to improve and save people’s lives, whilst not requiring more capacity from hospitals.

Currently if someone is diagnosed with epilepsy, they will likely be prescribed anti-seizure medication. Sometimes these medications do not help, and they can have severe side-effects. People with epilepsy, their carers and the clinical care team have a discussion to weigh up whether the treatment is working successfully.”
Yolanda Hill, Business Development Manager, **Neuronostics**

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SCENARIO TWO

Dr Abdullah Albeyatti, a GP in the Leeds area gave his opinion on how a home model of care could be useful.

“Virtual wards are already applied in terms of antibiotics that need to be applied intravenously and are proving to work well. At this moment we were getting involved with Bradford Royal Infirmary and Leeds Beckett university about a project for remote care. It’s in paediatrics and the idea is that you’d have semi-well children that might be able to be monitored at home for a few more days. And then once they’re better, you can just take them off the list. And if they didn’t improve at home, you’d bring them back in. We wanted to support them with the remote and the AI side because the idea is that if you had 26 children with asthma who were feeling a little bit better but needed a little bit more monitoring, you could send all 26 children home, which is better for children as they want to be in their environment with their parents and their toys.

If you sent 26 children home and you have a nurse checking on them. How are you going to know that there’s one who is 40 degrees and they’re really struggling to breathe? They will need to go back into the hospital, but you need to know in time. With our system, clinicians would be able to tell you by looking at the algorithm and checking the data that a specific child is the one that’s at risk of deteriorating in the next 24 hours remotely so they can then be visited first or brought back in. There’s scope for that kind of technology. And again, that will take the burden off the hospital and improve a lot of care.

Even beyond that, I saw once in a conference in New York that they were putting Internet of Things on inhalers. The idea was that they could show how many times a patient has been using that inhaler in a day. So, then a doctor will know if it is being overused and there is a chance that their patient is struggling. There are many ways that you can feed technology into this kind of environment.”
Dr Abdullah Albeyatti, CEO of **Medicalchain**

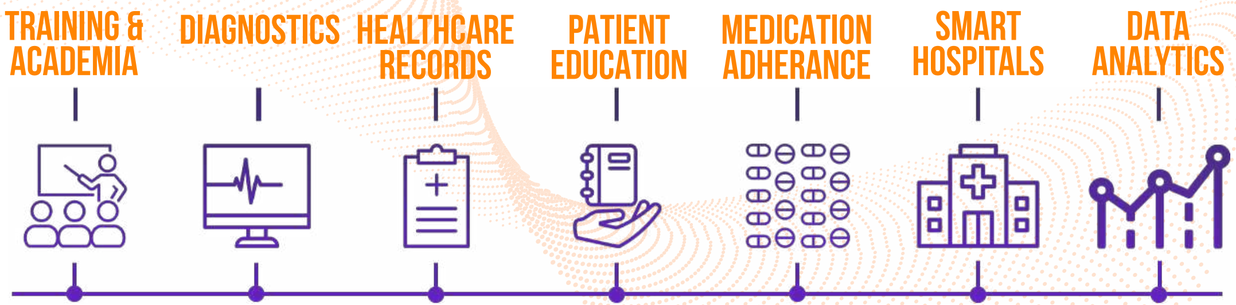
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09

EMERGING TECHNOLOGY

MedTech and HealthTech have benefits across the entire patient pathway, but there is value to be drawn beyond this, which could include practitioners' original training to the full supply chain of medication delivery. The scope at which MedTech covers is so expansive and will only continue to grow as advancements in technologies are made.

This paper consists of contributors from all facets of the MedTech and HealthTech industries. We spoke to each expert to understand how they are re imagining healthcare through their solutions. Leveraging their expertise and knowledge of the sector, they are deploying technology to drastically improve patient care.



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9.1 TRAINING

All surgeons go through extensive surgical training before they graduate, however surgical training should never be stagnant, practices that include training on the latest forms of surgical procedures and skills should be continuously developed throughout their career.

However due to a lot of pressures in the clinical environment, more surgeons are experiencing a lack of anatomy training, which is having a ripple effect on the level of surgical care patients are recieving.

Inovus Medical is helping to deliver the future of surgical training with their innovative technology.

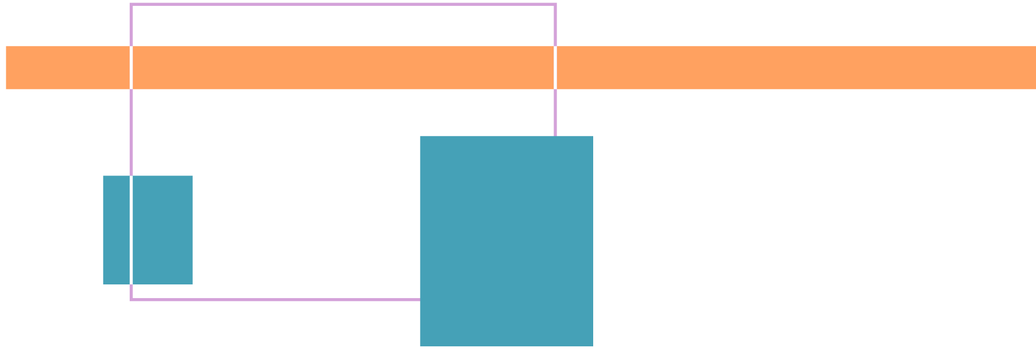
“Our training devices allow for safe training away from the patient’s bedside by following three main principles. One is utilising a patented augmented reality (AR) solution which allows us to provide all types of fidelity and functionally-task-aligned simulations with multiple levels of realism and resemblance. The second principle is providing devices that are agnostic. The third principle is that we follow a hub and spoke model by supplying institutional simulators that can be utilised and paired with portable simulators enabling training to be held in remote locations.”
Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

Inovus Medical has a clear purpose, to improve surgical care through connected training, and this indirectly impacts the level of care patients receive.

“What we’ve created is an augmented eality solution, which means real instruments are being used on surgical phantoms that replicate the visual and mechanical properties of organs that are typically operated on. We add an AR overlay to include the additional organs you’re not operating on, so that the reactions and movement of these organs can be imitated. It enables the use of hospitals’ existing instruments and allows clinicians and operators to be able to essentially build real muscle memory from natural haptic feedback, allowing skills learned to be translatable to a real operation. If you look at the market, the incumbent surgical simulators that are available with this level of fidelity are mostly virtual with little or no natural haptic feedback. Using AR, we’ve been able to apply patented computer vision technology to monitor the movements of the instruments and provide metrics based on how the operator is performing; considering metrics such as completion time, the economy of movement or distance travelled, acceleration, precision, smoothness, and handiness as a percentage. Considering this and the fact our cloud-based platform, Totum, can record all this data and associated video recordings, our solution can markedly improve clinicians’ ability to operate utilising an evidence-based approach. For the patient, it could lead to a faster recovery, due to a more precise surgery or less time under anaesthetic. As surgeons can operate quicker to a high level, they will be able to see more patients in the same amount of time.

The solution also enables us to train all healthcare professionals from different backgrounds such as nurse practitioners and physician associates. In the future, we could have a scenario where the surgeon focuses on those more complex surgeries or ones with complications, and practitioners could perform those routine operations following training on our devices.”
Dr David Rawaf

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“At the moment, the platform is mainly laparoscopic, to cover most of the major operations in gynaecology and general surgery. It also includes training modules and orientation exercises through LapPass by ALSGBI alongside working with the US equivalents, including officially partnering with EMIGs. We also have a hysteroscopy simulator, and we are in the process of developing and finalising endoscopy, endovascular, cystoscopy, orthopaedics, open surgery, and arthroscopy and that’s only in the immediate future. Totum will allow trainees to record and add videos from surgical and non surgical simulations & live procedures and save them within their portfolio which will follow them throughout their career. Our mission is to become the world partner for connected surgical training and for that we must cover every speciality possible. The procedures are designed for both junior and senior levels to aid both continuous learning and check if surgeons are healthy to operate. If you consider the parallels between pilots, they are not able to take flight without a set number of logged hours on a simulator – why would surgery be any different?”
Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

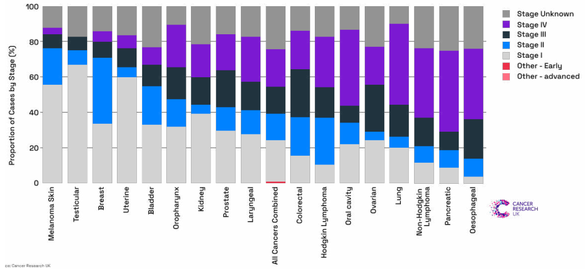
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9.2 DIAGNOSTICS

9.21 CANCER DIAGNOSTICS

There are around 375,000[14] new cancer cases in the UK every year, the majority of which are still being detected at later stages. Not only this, once a cancer has possibly been detected, it can still take weeks for results to be retrieved, having a direct correlation to the treatment success rate.

PROPORTION OF CANCER CASES BY STAGE AT DIAGNOSIS, ENGLAND, 2020



This combined with the fact that the pandemic has heightened pressure on cancer diagnostics in the NHS has led to longer waiting lists.

"Testing in the UK and elsewhere is facing a significant backlog. Even before the pandemic, these services were under pressure due to a lack of capacity and trained staff. Breast cancer is the most common cancer worldwide. Currently, within the NHS alone, there are over 2.4 million people waiting for further diagnostic tests and treatment in the NHS across breast, colon, and cervical cancers due to Covid19."
Dr Pahini Pandya, Founder and CEO, **Panakeia**

After having a daunting experience waiting for her own results, Founder and CEO of Panakeia, Dr Pahini Pandya decided to launch a solution that can significantly reduce the time to retrieving results through ground-breaking software. Dr Pahini Pandya explains how their technology can be applied in the clinical setting.

"Deciding the right treatment for cancer requires several molecular tests (or lab tests) following a cancer diagnosis by a Pathologist via assessment of a biopsy image. These lab tests which identify cancer biomarkers (such as mutations) take days to weeks and cost hundreds to thousands of pounds per patient.

Panakeia's software solves this problem by offering cancer biomarker information in minutes, without the need for molecular tests. This is done by using AI to analyse the biopsy images (same ones assessed by a pathologist to diagnose cancers).

Panakeia's PANProfiler platform uses AI-based analysis of images of H&E stained tissue samples to spot characteristic differences in the appearance of cells that cannot be seen by the human eye. Panakeia's first clinical product, PANProfiler Breast, is for breast cancers. This product is UKCA & CE marked and is currently being piloted within the NHS. Broadly, Panakeia's platform works across most solid cancers and the company has products for other cancers in the pipeline. Panakeia's PANProfiler software could transform cancer diagnosis, providing vital information to aid treatment decisions for up to 90% of cancers in a matter of minutes.

Ultimately, this will help to improve outcomes and save lives by reducing delays in the diagnostic process and helping to get the right treatment to the right patient quickly. Panakeia's offering can also be used in clinical trials to help select patients faster, leading faster development of new drugs that patients can benefit from."
Dr Pahini Pandya, Founder and CEO, **Panakeia**

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9.22
EPILEPSY DIAGNOSTICS

Around 50 million[15] people worldwide have epilepsy, making it one of the most common neurological diseases globally. However, current diagnosti practices leave room for error and don't assist in the long-term treatment for patients. Speaking to Yolanda Hill at Neuronostics we can understand how they are looking to transform the lives of those suffering from epilepsy.

"We've developed a digital biomarker of epilepsy to help clinicians diagnose and manage the condition. We envisage our technology being used to fit in line with the clinical care pathway, supporting neurologists in making a diagnostic decision by providing an additional piece of information.

Our BioEP algorithm analyses EEG data to inform a network model of a person's brain. We then interrogate the model to understand the propensity of that person's brain to having seizures.

Current practice relies on observing signatures of seizures in an EEG (only present in ~40% of EEGs recorded). Our BioEP technology can indicate a risk of epilepsy without relying on observation of the signals and can provide a risk score from all EEGs recorded. This has the potential to speed up diagnosis by reducing the numbers of EEG tests that people need (they often have to come back for another EEG if the EEG does not contain any information to support a diagnosis).

BioEP is an entirely new digital Biomarker of EPilepsy. BioEP uses routinely collected EEG recordings, automatically utilising EEG features which, for the large part, are not visible to the eye of a clinician. BioEP produces a mathematical model of the cortical network structure of a person's brain. Simulations of this model are then run to observe how likely it is for the person's brain to produce epileptiform activity. It is possible to simulate a week's worth of simulated EEG in a matter of minutes. This helps to inform the risk that a person may have epilepsy and therefore, acts as an additional piece of evidence to support diagnostic and prognostic decisions."
Yolanda Hill, Business Development Manager, **Neuronostics**

The speed of diagnosis is a critical aspect to getting patients to treatment sooner and Neuronostics are in the process of clinical trials to prove their solutions enable faster diagnosis.

"This could mean that patients don't have to return multiple times to hospital to receive a diagnosis. Average time to diagnosis for epilepsy is 1 year. This is a year of uncertainty and stress (which can be a trigger of seizures) and a higher risk of life threatening seizures, sometimes resulting in attendance to A&E services. If we can speed up diagnosis, it may mean that people can be expedited to optimal treatment sooner."
Yolanda Hill, Business Development Manager, **Neuronostics**

The ambition of healthcare is to move towards a proactive approach and Neuronostics solution aligns with this goal.

"We foresee our technology being applied for prognosis as well, as currently there are no objective markers of how someone responds to anti-seizure medication and they rely purely on patient feedback. Providing an objective marker of treatment response could provide faster paths to the optimal treatment strategy for that patient, reducing their risk of seizures and presentation to emergency services."
Yolanda Hill, Business Development Manager, **Neuronostics**

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9.3 HEALTHCARE RECORDS

For the entire healthcare system to operate effectively it must consist of accurate, accessible and secure healthcare records. No one knows this better than Dr Abdullah Albeyatti working as a GP in Leeds and being the Founder of Medicalchain. Medicalchain looks to address fragmented and inaccuracies in healthcare records. Dr Abdullah Albeyatti delves into the challenges that are currently being faced and how this is impacting patient care.

"Some of the difficulties faced by the NHS when it comes to medical records are; transferring medical records, accessing medical records, portability of medical records, and granting access to different individuals, just to name a few.

Discharge summaries are also a big problem. As a GP, your patient will come and explain the treatment received in A&E, and when I look at the A&E's discharge summary it doesn't give me enough information, so I'm then depending on the patient. I've had a patient tell me that they had a CT scan of the head for a headache, but the A&E notes didn't say that. So, how is a GP meant to know what the CT scan was looking for or what it found? This example could be potentially dangerous as I could then book them in for a second CT scan without realising. One CT scan is 500 rays worth of radiation to the skull and brain in one go. And that could lead to cancer."
Abdullah Albeyatti, CEO of **Medicalchain**

To help overcome the lack of transparency in medical records, Abdullah co-founded Medicalchain and MyClinic, a blockchain enabled platform which puts the patient in control of their medical records, to share as needed. At this time medical records are stored internally by NHS on their secure servers, so decentralising this away from NHS servers must come with stringent data protection and that is exactly when Medicalchain chose to utilise blockchain technology.

"The blockchain element is so critical for medical records because it isn't edited. How does a doctor know that the medical records you have provided them with are a true reflection of your medical records? How do they know you've not deleted or altered something? The idea of blockchain is that it's a trustless, decentralised, distributed system, which means there's no way to lie about what is shared. A doctor can be sure that the information has been inputted by another clinical professional who is accredited and a trustworthy source of information. So that's why we wanted to implement that kind of blockchain element at Medicalchain.

I think the first thing we have to do as a society that wants better healthcare, is we need to demand access to our health records.

Health tourism is a big deal when it comes to the blockchain element. People come all the way from the Middle East to get treated in London, for example. We want to know that the records that are coming here are accurate so we don't have to redo their blood tests and scans. So that's where blockchain becomes more and more critical for a better system that's also more international."
Abdullah Albeyatti, CEO of **Medicalchain**

Tackling the fragmented and often siloed patient records held by the NHS can deliver incredible efficiencies, but even more importantly it can deliver greater patient care to those seeking treatment.

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“I would say our solution enables better patient care in two ways. Number one, it improves access to health care, because you’re not going to be limited by one GP practice. You have access to your medical records, so you can take them wherever you want to.

The second reason comes because I think some of my older colleagues haven’t really switched on to the dawn of Google. A lot of them don’t like it when patients Google their illnesses and symptoms, whereas I absolutely love it. I think it’s great when patients come to us already knowledgeable about their own health problems. They’ve researched it, and yes, they might come with the wrong answer, but then that makes my job so much easier.

I think giving patients access to their medical records means they can take more ownership of it, they can take more real interest in their health problems. If you can link this to a kind of real authenticated and qualified health encyclopaedia, then you’re only going to improve better patient care.

I think we should be trying to foster that kind of understanding and that kind of ownership responsibility. You need to look after your own health. Yes, there will be some cost implications at the beginning. But if you get patients to look after themselves better, then they won’t flow through the system as much and you won’t have as big of a problem.”
Abdullah Albeyatti, CEO of **Medicalchain**

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9.4 PATIENT EDUCATION

Following the theme of patient empowerment, patients want to build a greater understanding of their health and treatment course but to achieve this there is a huge education curve that needs to be addressed. Cognitant is a dedicated healthcare educational platform that can improve patient outcomes through personalised, patient-centric health information. Alex Merckx gives her perspective on addressing misinformation in the health industry.

"Misinformation and poor access to reliable health information leads to *avoidable harm and increased costs*. The majority of people still trust their clinicians as their preferred source of information about health, but due to the lack of consultation time, clinicians are often not in a position to be able to educate a patient face to face.

The traditional patient information leaflet tends to be text-heavy, dry and complex. 61% of England's working-age population find these health materials containing both text and figures too complex to understand[16]. The result is that people are not empowered with the right information to understand how to best manage their health and around 50%[17] of people don't take their medication properly.

Low health literacy is associated with greater difficulty in managing chronic illness, greater use of medical services, lower levels of health, and higher mortality in older people, vs higher health literacy[18]. *In fact, low literacy skills are one of the strongest predictors of poor health outcomes*[19]. This also has a financial cost – 3% to 5% of the annual UK health budget[20].

As was very evident throughout the Covid pandemic, when people are not offered credible, accessible, culturally and language appropriate health information, they turn to the internet and social media for their health information, which can result in inappropriate patient self-care, poorer health and even, in some cases, death. The risk of misinformation being disseminated via social media is high. Around 70% of Americans have been exposed to medical misinformation. Social media is the dominant source of misinformation (82%) which is of particular concern when 44% of adults[21] find they lack the confidence to distinguish between medical information that's accurate or not."

To help address misinformation in healthcare, Cognitant has designed a patient-centric platform that explains treatment practices in an accessible way.

"Cognitant *drives improvements in patient outcomes and healthcare efficiencies* through personalised, immersive, patient-centric health information and digital services. The company follows a robust *research and co-creation process* with patients, placing them at the centre of the design process.

Working with the NHS, patient advocacy groups, life science companies and care providers, Cognitant designs and creates *immersive, interactive health information and support tools* designed to *change patient behaviour and outcomes*. On average, Cognitant's health education resources deliver a 70% increase in patient knowledge and 35% intention to change patient behaviour.

Cognitant's data-driven information prescription platform, Healthinote contains over 7,000 pieces of validated health information across all therapy areas developed by Cognitant's or it's trusted content partners. *Healthinote enables clinicians to seamlessly share trusted health information with patients.* Healthinote thus *saves clinician time, improves patient reported outcomes and reduces unnecessary complications* across many care pathways."
Alex Merckx, Director of Marketing & Partnerships, **Cognitant**

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9.5 MEDICATION ADHERENCE

It is estimated that there are currently around five million[22] patients in the UK taking four or more medications. With such a vast amount of medication being prescribed, medical adherence is becoming a growing concern in the NHS, particularly when you consider the movement towards a virtual ward healthcare setting where adherence will solely be the responsibility of the patient.

YOURMeds are aware of this stemming issue and developed a solution that is dedicated to boosting medical adherence across the NHS. Dr Nitin Parekh, Director of YOURMeds provides their viewpoint on the topic and how their solution is the remedy.

"The World Health Organisation and NHS recognise that only 50%[23] of all medication is taken as intended. The impact of poor medication adherence is felt by adult social care who commission care visits to support people to take their medication on time.

YOURmeds brings the standard dosette box into the 21st century through our innovative system that uses nudge theory and the free social capital of friends and family around a user to support increasing adherence. The YOURmeds system is similar to an advent calendar, when it's time to take your medication the smart tag displays a number and the user matches the number shown to the pod on the pack.

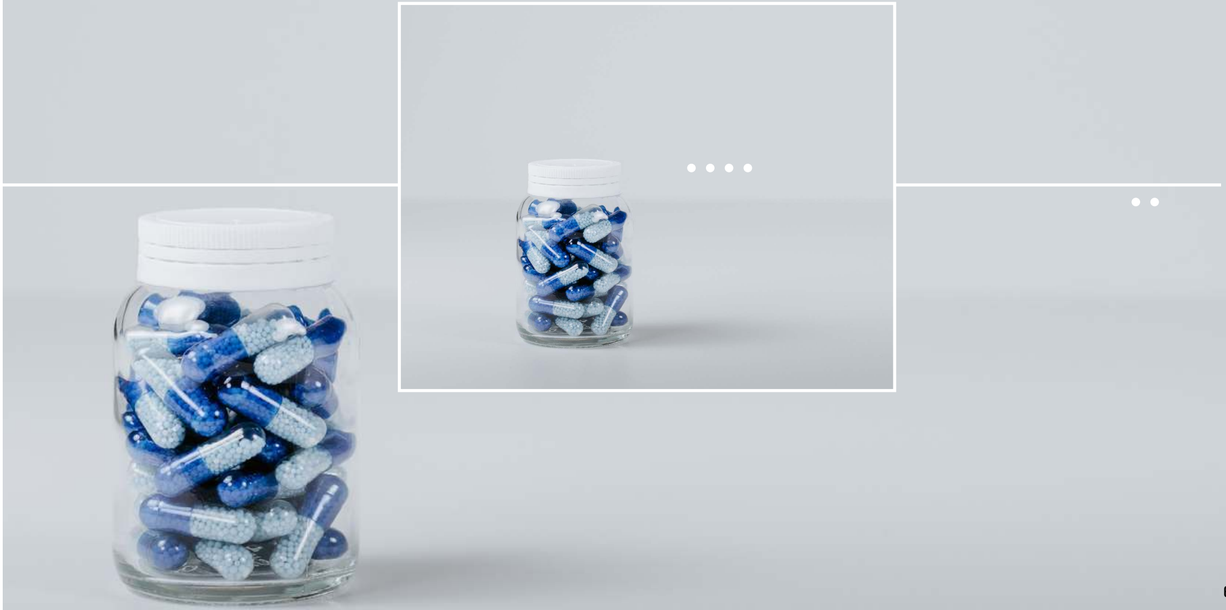
10 minutes after the initial alarm the first supporter is informed via an app on their phone that the medication has not been accessed. Every 10 minutes a new supporter is informed. We know that one in four of our adherent rounds is due to that supporter nudge.

We know that speaking to our service users and their carers there is often a discrepancy between how adherent the user thinks they are with taking their medication and what the supporter experiences and sees through missed medication in the home. People often forget to take their medication or will get muddled especially if they have multiple medication rounds daily. In England more than one in 10 people aged over 65[24] takes at least 8 different prescribed medications weekly and this increases to one in four among people who are aged over 85."

Medication is the pin that holds a treatment plan together, so ensuring that patients take medication as prescribed is hugely impactful to the outcome of the treatment, whether that be short or long-term. Dr Nitin explains further how their solution underpins patient care.

"By supporting patients to improve their medication adherence, having the data to inform care packages and manage patients' conditions especially within the new virtual wards being commissioned is crucial to improving patient care. The New Medicines Service commissioned by the NHS delivered by pharmacies supports patients with regular reviews by their local pharmacy. In 2021 this service was extended to include 16 conditions from the original 5 diseases of Asthma, Type 2 Diabetes, High Cholesterol, Hypertension and Schizophrenia. This service was commissioned as the NHS recognised that increasing medication adherence to 80% could save the NHS £930 million across the 5 diseases and vastly improve the health outcomes of patients."
Dr Nitin Parekh, Director of **YOURMeds**

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9.6 SMART HOSPITALS

A phrase that is becoming synonymous with digitalisation is 'SMART' and it is one that is impacting every sector. When speaking directly to hospitals, the paradigm of care is shifting and its utilising technologies to operate in a more efficient way to improve care delivery but also connect the hospital to the wider healthcare delivery ecosystem.

SMART hospitals integrate assets and resources across the environment for near real-time access and analysis, informing and accelerating patient journeys. To achieve a SMART hospital, it involves the integration of specialised technologies. Kinsetsu has created an intelligent tracking and locator solution. Ken Moran, Business Growth Director at Kinsetsu illustrates the core advantages their solutions can deliver.

"The benefits of Kinsetsu's real-time asset tracking revolve around unprecedented traceability, reduced expenditures, improved time management, and enhanced staff morale, all leading to improved patient experiences and outcomes. The real-world benefits extend right throughout the healthcare ecosystem, making staff, business and patient experiences better. For example:

- **Significant saving of financial and time resources, both of which are severely scarce in healthcare.**
- **Vastly improved patient outcomes – via far less time wasted searching for clinical assets.**
- **Reduction in over/re-procurement – via more effective management of clinical asset inventory.**

Incorporating intelligent asset tracking solutions through passive and active RFID technology empowers staff to quickly locate, manage and utilise medical equipment more efficiently. It also enables staff to be informed, react and operate in real-time, as they spend less time searching for medical assets and can thus focus more on patients and their outcomes.

Proper medical asset tracking improves patient safety and wellbeing, as medical assets coming towards the end of their lifecycle can be removed or upgraded as required. By having a clear view of data around the condition of key assets, patients are undeniably provided with better care."
Ken Moran, Business Growth Director, **Kinsetsu**

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9.7 DATA ANALYTICS

A core element of the SMART hospital infrastructure is data and as many of us will be aware the NHS is home to a whole host of data.

"With the enormous abundance of data available to the NHS, there is an undeniable opportunity (and even responsibility) to leverage it to improve the workplace environment. Only through harvesting and properly analysing relevant data can issues, threats and opportunities be identified, addressed, monitored, and alleviated.

In a hospital environment, for example, sufficiently harvested and analysed data can improve communication between staff, which in turn improves doctor/patient communications. Having a clear view and understanding of the right data undoubtedly improves patient outcomes, maximises staff productivity, and even saves lives."
Ken Moran, Business Growth Director, **Kinsetsu**

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10

ACCESSIBILITY

The healthcare sector is undergoing a tremendous amount of change, involving a lot of rethinking and adapting current practices. But as the sector changes, it's imperative that everyone is brought along on that journey. Dr Martin Stow discusses some of the stemming problems in terms of accessibility in the MedTech field.

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"There are significant emerging markets in China and India, and these represent a major growth opportunity. In developing countries, medical issues often progress far before receiving treatment, so medical technology needs to be much more robust.

There are also needs unique to these markets, and businesses that can address these will have a major advantage. However, these regions are harder to reach than domestic markets. There are linguistic and cultural barriers that must be overcome. That's why Nexus places focus on going beyond STEM – successfully rolling out MedTech solutions is as much about community, culture and connection as it is about technology.

There is also a major issue of representation within data. Medical devices have historically been made for middle age white men in wealthy countries. We need to address this and ensure that technology works for everybody. MedTechs need to embrace diversity as a strength and work to overcome the biases in the industry – including in the funding system. Universities have a significant role to play here in making inclusive policy decisions."
Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

Inclusivity and accessibility aren't just points that need to be considered from a government policy perspective, it must be at the forefront of MedTechs minds when they develop solutions to fit within the healthcare setting. Dr David Rawaf explains how Inovus Medical have placed accessibility at the core of their business model.

"Accessibility and affordability go hand in hand. If something is expensive it cannot be accessible; it can be functional and not accessible. The challenge of innovation is making, preserving, or increasing functionality while still maintaining affordability and accessibility. At Inovus, these values are quite literally our Holy Trinity!"



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10.1

PATIENT ACCESSIBILITY

Moving onto a local level, Leeds City Council has developed a Digital Strategy for 2022-2025 that sets out the plan to move Leeds along its digital journey. As an exert[25], Cllr Debra Couper, Deputy Leader of Council & Executive Member delves into how accessibility is core to the strategy.

“Improved use of data and technology already enables us to access some services around the clock and manage our own health better in ways that were unimaginable even 10 years ago. And whilst digital continues to play an increasing role in how people live and work, for far too many, it is still a barrier. To ensure no one is left behind, it is essential we prioritise those who are digitally excluded.”

To focus on the industry aspect the council will be investing further in the city’s flagship 100% Digital Leeds[26] digital inclusion programme. 100% Digital Leeds works with hundreds of organisations and members to identify, prioritise and support the most digitally excluded people and communities in Leeds.

They are running a vast range of initiatives, some of which include; digital health hubs, supporting care homes and digital inclusion toolkits to assist other councils on their journey.

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10.2

CLINICIAN ACCESSIBILITY

As accessibility must stem across the healthcare ecosystem, this includes the clinicians who must embrace and properly utilise digital solutions, but to do so platforms must be built to be easily adoptable.

“The last thing we want to do is provide a solution that requires significant retraining. We’re giving a solution to people who don’t work in IT. In some instances, we have co-designed the solution with our customer and we have engaged the stakeholder and user community at the outset of solution design so that when we deploy the solution, it will be well adopted by team members”.
Ken Moran, Business Growth Director, **Kinsetsu**

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INTEROPERABILITY - A COHESIVE SYSTEM

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Whilst the expansive range of MedTech and HealthTech solutions is great in one respect by providing high-levels of competition to boost innovation alongside delivering a host of much-needed and application-specific solutions. On the other hand it means there is a range of solutions that have been built to operate in different ways, on different platforms and in many scenarios are not built to work alongside other innovative technologies.

Although to truly achieve a digitally-embedded healthcare system that will deliver unparalleled patient care that is proactive, efficient and tailored to each patient, it needs to combine various solutions across all facets of the patients journey and therefore each of the technologies applied need to connect and speak to one another. Dr David Rawaf explains how a homogenous language used across all technologies is the foundation to an interoperable system.

“The semantic interoperability of these technologies is so important and the way that we do that is by ensuring the languages are the same. This goes back to what we’re doing in our business where we are allowing surgeons to bring multiple sources of information onto our platform, which could even be live surgery data. In the wider market there essentially needs to be a certification to prove that technology is interoperable. Professor Michael Miller has been leading on this for a number of years with the WHO. It should be from both sides as well, as currently tech companies operate differently in addition to hospitals and institutions not doing the same thing; it’s a double-siloed approach.

I think everyone designing a MedTech solution must ensure it will work with other technologies, this includes their competitors and counterparts, essentially operating with co-opetition in mind.”

“It is in my opinion that technology is the cornerstone of everything that will fix the problems we have in healthcare. You have patient records, which are siloed in different clinical environments, but your GP only has access to GP records, your hospital only has access to the hospital records, your holiday in Spain only has access to your x-ray when you went over your ankle when in that country. But if you can bring all this information together and empower the patient to be the conduit carrying the data with them from one appointment to another, you will remove so many barriers. You will really mean what you say when you say patient centred care.”

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12

A HUMAN-CENTRIC APPROACH

The healthcare system is built upon the principle of helping people. The formats may vary but physicians still to this day take the Hippocratic Oath to signify their abidance to the several principles of medical ethics which remain significant today. Whilst there may not be an oath for the MedTech sector, all technologies should consider people and the level of care they receive centrally to the solutions they design, and how their technologies could in fact improve patient care.

We spoke to our contributors to understand how they placed patients at the core of their technologies.

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"Our mission is to improve the lives of people living with epilepsy or suspected of having epilepsy. Therefore, hearing their views on the technology used to inform their diagnosis and care is absolutely critical. We work with a fantastic group of people with lived experience of epilepsy who help us in our mission in a number of ways. We are currently conducting a research project with them to develop a new technology to help people monitor their condition from home. The research has shown that signals from the technology are of good enough quality to be used in our BioEP algorithm. We continue to work with them on the development of the tech, making sure the final product aligns with their priorities (affordability, comfort, look, ease of use).

More generally, discussions that we've had with the group around topics such as the current care pathway and their views on the use of patient data have informed which products are our priority and how we structure the development of the tech."
Yolanda Hill, Business Development Manager, **Neuronostics**

"Panakeia was founded on patient and stakeholder experience. I know first-hand the anxiety of waiting for your test results.

Having lost a childhood friend to cancer, I took up a PhD focused on understanding how cancers spread across the body. It was during this time that I had my own cancer scare. I had to wait for a whole month for the results of lab tests before getting an all clear. Coincidentally, I had also done very same lab-tests routinely in the lab during my PhD. I understood the reason for the delays but found them even more unacceptable if a patient is dealing with a fast growing cancer.

That is why I founded Panakeia in late 2018. As we grew, we formalised a patient-first and stakeholder-focused mentality as a core tenet of our culture. Today, this is what drives every single one of us in the Panakeia team to deliver products that bring true value. People-focus should be a founding principle for all companies, not just MedTech companies."
Dr Pahini Pandya, Founder and CEO of **Panakeia**

"When you're building any kind of company or solution, you should always start with the problem first and then work backwards. And in healthcare the problem inevitably is going to be 'how do I get this patient better?' So if you work out how to get this patient better in a more efficient and cost effective manner, then you're onto a winner.

The problem we have in our system in the NHS is the question 'who is the payer?' The NHS will say they have no money to spend on it. A patient will say they shouldn't be paying for it because they pay their taxes. Unless you get a pharmaceutical company to step in and foot the bill, that will always be the question.

So, for many MedTech companies, sometimes the best way to be successful is to focus on the payer. The byproduct of that is maybe the patient will benefit. It's the wrong way round but it's often the way it is."
Dr Abdullah Albeyatti, CEO of **Medicalchain**

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13 ADOPTION

13.1 UK HEALTHCARE ADOPTION

The past few years has certainly been a catalyst for the adoption of digital technologies in the healthcare sector, nevertheless there is always progress to be made to build a better healthcare system.

But whilst we've heard from the sector about its embrace of the digital ecosystem we wanted to hear from MedTechs and HealthTechs on how they perceive adoption in the healthcare sector.

"The pandemic has accelerated the shift to online and changed patient expectations and clinical willingness to adopt new ways of working. It has also encouraged new collaborations to be formed to facilitate digitally enabled care pathways. The vaccine programme made use of advanced data analytics to drive the risk stratification, population segmentation and operational rollout. During the pandemic, 96,000[27] people were monitoring at home or within a care home, outside of the hospital setting. Most GP surgeries, hospitals, mental health services and community care services now offer remote or video consultations.

The NHS are encouraging the transformation of the healthcare sector, empowering the newly formed integrated care systems (ICSs) to deliver better citizen health and patient outcomes, with technology a major focus in their strategy. Key to success will be collaborations between technical specialist providers so that patients and clinicians alike receive a seamless, unified and consistent experience, as opposed to the fragmented experience which is often currently the norm."
Tim Ringrose, CEO of **Cognitant**

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“As more sectors globally continue to adopt and benefit from technology, the healthcare sector naturally becomes more receptive to incorporating new and better ways of doing things. In a digital and technology-focused world where often “first is everything”, we actually believe that healthcare must take a “wait and see” approach to tech, constantly watching, analysing and shaping proven technologies to work in a healthcare setting.

So yes, healthcare is becoming more receptive to technology, but there’s a strong case for the sector looking outside itself a little more to make sure that it learns from other areas, transfers skills and uses cases where relevant, and shapes solutions that are tried, tested and the best fit for healthcare settings.”
Sue Streatfield, Partner, Intellectual Property, **Clarion**

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13.1 UK HEALTHCARE ADOPTION

“I think the appetite for adopting technology has passed its peak. I think the peak was pre COVID. And then during COVID there was real appetite within the healthcare sector for technology. There was a lot of funding that went into it. I think the real challenges that we have in healthcare today such as backlogs, waiting times for GPS is the real issue now. So, technology is taking a backseat even though technology could solve these problems. People don’t recognise how the two are linked. So, it’s taking a real backseat to more pressing concerns that they have.”
Dr Abdullah, Albeyatti, CEO of **Medicalchain**

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“NICE are moving to include assessment of digital health technologies and the NHS have created several mechanisms to support innovation and adoption such as NHS digital, The NHS ransformation Directorate, the Academic Health Science Networks, the Accelerated Access Collaborative etc. However, pace of adoption can be challenging, particularly considering funding pressures on start-ups. Understanding the complexities of healthcare systems can sometimes prove difficult and so it’s essential to find the people and systems to help navigate the route to market (such as the Academic Health Sciences Networks). Clinicians are notoriously short on time and healthcare budgets are tight. Again, finding clinicians who see the potential in the technology and who are willing to champion the company and product are absolutely critical to further adoption.”
Yolanda Hill, Business Development Manager, **Neuronostics**

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13.1 UK HEALTHCARE ADOPTION

“The healthcare sector has always been innovation-driven. We wouldn’t have the life saving surgeries, disease curing medications and all-round patient care had the space not been open to adopting innovation and technology. Somewhere along the way we forgot that but recent events, especially Covid-19, have just reminded us of its importance. What the sector needs to focus on is how to make the best possible innovation accessible to patients across the world and we hope to be able to play a part in this.

Covid-19 has shifted the world’s focus on healthcare. The acute need created has shown how the industry can come together to deliver life-saving care and medicines in a rapid timeframe while still focusing on patient safety. As a result, the sector is now more open than ever before to accelerate the adoption of new technology. Of course, it’s not at the same pace as in other sectors given prime focus has to be patient safety.

The UK has already been playing a major role in leading the change within healthcare, even before Covid-19. The Government’s support for the adoption of AI into the NHS is just a prime example of that. It will be important for us to not forget the positive learning from Covid-19 experience and fall back into old habits.”
Dr Pahini Pandya, Founder & CEO, **Panakeia**

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"There are three related issues to adoption – what new technology, the process of evaluation and the ability to embed it within the NHS at scale.

There is more certainly talk about using technology to improve the healthcare sector and the NHS has multiple programmes to support MedTech. Whilst this is very welcome, it is still unclear as to what technology the NHS is interested in using. For example, the pathway to adoption of new drugs, procedures and equipment is clear. However, there is a disconnect between new technology being created, and the willingness or desire to adopt it within the NHS.

Evaluation is an integral aspect of adoption. Yet outside of 'mainstream' clinical trials, evaluation is complicated, often confused and opaque. Key reasons for this are lack of connectivity between various datasets, lack of communication between health and social care and disconnect between care providers and the end patient. For evaluation to be seen to be transparent, data should be readily accessible and 'clean'. For many smaller firms, the costs of getting independent evaluations are prohibitively expensive.

The third aspect – scaling, leads on from the above. The NHS runs many small scale pilots, but the criteria for a wider roll-out are often not stated. In part this is a result of the atomised structure of the NHS, where historically each CCG was autonomous in implementing what it considered appropriate. The result is that there were essentially 150 different buying organisations, with results not necessarily accepted across CCGs. With the creation of the ICS framework, this is now down to 42 bodies, but again commonality of acceptance standards are as yet undefined. The situation is further complicated by the lack of 'forced implementation' from above, so innovation usually dies a slow death. AHSNs play an important role between private companies and the NHS but lack the credentials to push innovation through."

Dr Nitin Parekh, Director, **YOURMeds**

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13.1 UK HEALTHCARE ADOPTION

"In the last decade we've seen a lot of technology where incredible high-tech solutions have been implemented in theory and practice with case examples, but the UK market overall just simply is not ready for it. This is due to: number one, resistance to change. Number two is flexibility to adopt alternative solutions and the third reason is simply procurement, presenting numerous barriers to entry. There is definitely a change happening, for example, there are programmes like the InSites Programme which essentially allows healthcare companies to apply and speak to ten procurement officers at once. Everything should be more top-down; it shouldn't be siloed and fragmented because we lost the semantic interoperability of different software."

I think the next generation will be a lot more open to embracing innovation due to the education they have received around technology. I have set up an internship / experience programme for some of the most highly-talented individuals who have been able to dive into academia, R&D, and business strategy to inspire them to even come up with their own ideas on how to improve care in the future. I hope this is a model that can be adopted widely across the world. Doctors of the future should not just be clinicians and leaders, but also innovators."

Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

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13.2
PROMOTING ADOPTION

Whilst it seems agreed on both sides that changes need to be made to the healthcare system, it's definitely easier said than done. Promoting change and reinforcing successful implementations of innovative technologies involves a network of stakeholders but it must have champions at its core.

techUK is a champion promoting digital change in the National Health Service.

"techUK is the trade association which brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. We create a network for innovation and collaboration across business, government and stakeholders to provide a better future for people, society, the economy and the planet. With health and care systems around the globe facing increasing pressures, the use of digital technology has never been more important. We support the UK's vibrant ecosystem, which has the potential to become a world leader, by helping our members navigate the complex space of digital health in the UK and ensure our NHS is prepared for the challenges of the future."
Alex Lawrence, Programme Manager, Health & Social Care, **techUK**

The promotion of adoption is something that spans across public, private and third-sector organisations. Each of which should be working towards the same goal of driving innovation. It's also integral that innovation is being steered or developed by those with industry expertise, to establish solutions that are truly fit for purpose. Dr David Rawaf's passion for this topic has led to him collaboratively starting an initiative to support innovation in the NHS.

"I have assisted in setting up a Workforce Strategy Committee with key players from the Association of Surgeons in Training, Royal Colleges, General Medical Council, Health Education England and NHS Federation.

They're trying to create an integrated innovation training pathway which is essentially an opportunity to allow doctors and surgeons to take a placement away from their usual cycle of rotational placements and have a four-to-six-month period either learning from a company in the industry or trying to set up their own company, which is itself ideally a solution to a real problem faced by the NHS. It means that surgeons or doctors don't have to quit their training jobs entirely to create solutions or learn from the industry, meaning we retain staff but also allow them to innovate because, in reality, the innovations of the future need to come from those on the front line.

The problem is collaboration is difficult right now. Firstly, there's no time for clinicians to innovate due to their workload, and secondly, we are losing talent to industry from those who have chosen to pursue their own business. The idea of the Workforce Strategy Committee is to create a formal pathway where people can learn, understand, and contribute to innovations built internally within the NHS."
Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

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13.3
BARRIERS TO ADOPTION

Whilst adoption of MedTech is a must, there still remains some very clear barriers to entry that exist in the healthcare sector, both on a global and local level. From our discussions with leading executives in the MedTech field, they brought to our attention the types of barriers they are facing when it comes to adoption in their specified field.

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"There is certainly still a resistance to technology within healthcare, and this is understandable. There's no margin for error when you're dealing with peoples' wellbeing, so a degree of caution is appropriate. However, being overly cautious can also have negative consequences – like depriving patients of access to the latest technologies and increasing wait times – so it's essential to strike the right balance.

It's also important that resistance comes from the right place – a desire to protect patients – rather than nervousness about using unfamiliar systems or a preference for doing things "the way they were taught." Medicine and technology move forward at a rapid pace and delivering the best for patients requires staff to stay at the cutting edge.

Regulations are still one of the major factors in how quickly healthcare technologies can be adopted. One silver lining of the pandemic is that it has pushed decision-makers to question their assumptions, and some barriers to implementing tech have fallen away as a result. Now, the challenge is that the NHS must continue to adopt new technology at the same pace as during the pandemic. It's essential that decision-makers create a forward-thinking policy that ensures patient safety and enables the system to benefit from technological advances."

Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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13.3 BARRIERS TO ADOPTION

"It's simply not their priority. Their priority is waiting lists, car parking issues, complaints, staffing issues. When you talk about technology, they only want to see technology that will make a real difference to those service issues. It's very sad to say, but the patient is the last person they care about in the system. If they really cared, a lot of services would be structured and tailored towards 'what's the best experience we can give a patient?' and it's not 'how can we get away with an acceptable level of service before people riot?'.

Just look at dentistry as an example. You can tell a member of the public now that you cannot see a dentist under the NHS. How has that turned into an acceptable thing? There are no NHS dentists out there. I can't see a dentist unless I go privately. Why are we all paying tax for a healthcare service when you can't see a dentist?"

Dr Abdullah Albeyatti, CEO of **Medicalchain**

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“There are several industry-wide barriers that we have seen towards adoption - regulatory, investment, evidence generation, and reimbursement to name a few. Some of more specific barriers if you are developing AI solutions or trying to tackle a workforce shortage problem include:

- **The lack of appropriate regulations needed for AI**
- **Target users not having time to try our new innovations due to growing workforce shortages & work burden.”**

Dr Pahini Pandya - Founder, CEO of **Panakeia**

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13.3 BARRIERS TO ADOPTION

“The key barriers are:
1. acknowledging the need itself
2. evaluation
3. funding.
First, there is a real disconnect between health and care. Health does not believe that supporting patients with their medication is their responsibility. The NHS sees its role as meeting the point of need, not with what happens after that immediate need is met. Social care has a fiduciary responsibility to look after people that have been assessed as needing support, and medication is a part of that. Looking at this logically, what happens after the immediate need is met (health) matters crucially to avoid further needs to be met (health). So social care accrues the cost, but health the benefit. This has become a football which leads to inertia, worse outcomes and higher costs.

Evaluation within a care setting for technologies like ours are difficult – what data should be collected, how do you evidence a better outcome, and should the evaluation be limited solely to cash savings or outcomes also included.

Finally, there is no central funding pot available – often the pilot fizzles out, despite the strength of the results, because it is unclear where future funding can be sourced.”

Dr Nitin Parekh, Director, **YOURMeds**

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14

REGULATORY & LEGAL

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As healthcare evolves at a rapid pace, regulatory policies need to prepare for this digital transformation. There is a critical need for regulators to set a precedent of what's expected from technology providers but also setting the framework to protect innovation when it enters the market.

14.1 INTELLECTUAL PROPERTY

One critical element that will ensure innovative technologies are adopted by the healthcare sector is intellectual property. Virginia Driver, European Patent Attorney, and Director of Page White Farrer explains the importance of MedTechs and HealthTechs seeking coverage.

"There's a lot of innovation being carried out in the field of MedTech, by an increasing number of start-ups and they need investment. In order to get this investment, they have to demonstrate that their innovation is exclusive and therefore it needs to be protected.

For larger companies that are more established, they need to make sure that they are protecting their leading edge with patents. Otherwise, all of the investments they make into R&D can very quickly fall away if a similar product comes to the market. So, at our end, it's all about protecting that R&D investment."

As an expert in the field, Sue Streatfield goes on to explore this subject to demonstrate why a lack of IP protection could leave a MedTech vulnerable.

"If a MedTech company owns a patent, it has a legal right to stop anyone making a product that would infringe that patent. If the technology protected by a patent is of interest to the market, patent ownership maximises the potential to obtain revenue from that technology. It follows that the rate of technological innovation would be significantly slower without a right to protect the IP.

If the MedTech is software, anyone would be free to analyse its functionality and write their own code to emulate it without infringement unless that functionality is protected by a patent. So, if you're a MedTech company, and you don't have a ring of protection around that software functionality, it will probably be hard to attract investors.

Another issue is credibility and reputation in the marketplace. A company's profile and reputation can be heightened by having a monopoly on its technology in the marketplace, giving it a greater potential to attract new customers and investors (and therefore to continue to improve its technology). So, patents can enable companies to improve their prospects of increasing market share."
Sue Streatfield, Partner, Intellectual Property, **Clarion**

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14.2

CHALLENGES FACED

As mentioned, IP is an integral element of solutions must possess to enter into and maintain their market share, but Sue Streatfield explores the challenges MedTechs usually come up against when trying to gain legal protection.

“A key issue is whether the product in question is patentable because there are strict rules around patent eligibility. To qualify for patent protection, the product would need to be new and inventive at the patent filing date over what was known by experts in that field at that time. In the UK, an additional requirement to obtain a patent for software is that the software must have a technical effect. If the software in question drives a piece of machinery such as a ventilator, for example, there is an element of physical functionality that should be regarded as a technical effect. However, if the software does not cause a physical response, the issue of whether it has a technical effect rendering it eligible for patent protection is more nuanced. The trends in case law suggest that a court is increasingly likely to find that there is ‘a technical effect’ within the meaning of the legislation if it regards the impact of the software to be truly innovative.

Even if a product would qualify for patent protection, it doesn’t follow that the patent owner would be free to commercialise it. There may be earlier patents owned by third parties which the manufacture and/or sale of it would infringe. Before starting work on developing a new product, it’s sensible to do a clearance search to look for potential obstacles in the patent landscape. These could be earlier patents which either render a product ineligible for protection due to it not being new and inventive and/ or which would be infringed. If any potential obstacles are identified, consideration can be given to whether they can be worked around (for example by adapting a product to avoid infringement). Carrying out clearance searches before seeking investment is often sensible because a prudent investor would typically carry out due diligence checks to look for comfort that there will be no rocks in the road before taking the risk of investing.

Another potential big barrier is money, as it can cost a few thousand pounds to file a patent and significantly more to obtain patent protection in multiple countries.”
Sue Streatfield, Partner, Intellectual Property, **Clarion**

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14.3

AI-BASED INNOVATION

At this time technological innovation is progressing faster than regulation and one technology area that is often considered a ‘grey area’ in legal terms is AI. Virgnia Driver from Page White Farrer is a specialist in AI protection particularly in the MedTech field. She delves into the obstacles faced in this emerging field.

“I think there are a lot of myths as people make assumptions about the law surrounding AI and software. But if you have a piece of medical technology, such as imaging technology, it is patentable as long as it has a technical purpose. And the irony of MedTech is that there is nearly always a technical purpose because there’s always a physical effect of some kind.”

Another sub-division of this that is currently being debated in court is innovation that has been created by AI.

“It’s currently being considered by the patent court in some countries, whether or not you are able to protect an innovation without a named human originator/ owner. You can, but you need to name a human inventor. For example, if you have an AI machine that generates a new and useful drug, you can protect that drug and / or the AI machine that came up with the drug, but you have to name a human originator.”
Virgnia Driver, European Patent Attorney, and Director of **Page White Farrer**

Sue Streatfield from Clarion leads on from the points above and provides alternative ways in which MedTechs can protect their products.

“The current position under English law is that inventions wholly created by AI systems are not patentable because the term ‘inventor’ in the Patents Act 1977 relates to a human being and therefore a patentable invention must have been created by a human. However, guidance published by the UKIPO on 29 November 2022 suggests that AI innovation invented by a human being may be eligible for patent protection under English law if it has a technical effect.

There are only two other ways of protecting software apart from filing a patent. One is to put in place strict confidentiality protection mechanisms around the code, only allowing access to it on a strictly necessary basis and adopting strong security measures. That means incorporating strong confidentiality obligations in contracts with employees and other contracts engaging contractors and consultants. The other is to put into the code, “sleeper code”. This is essentially incorporating a typo in code that would be visible if the code is copied, giving clear evidence of infringement. This can also be done by writing in redundant software code.

In short, the more you share software and enable it to be accessed, the more likely it will be copied or hacked/ stolen.”
Sue Streatfield, Partner, Intellectual Property, **Clarion**

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14.4

SUPPORTING MEDTECHS

The regulatory landscape can be difficult for MedTechs and HealthTechs to navigate, especially when not all the legislation is clearly defined. Both PageWhite Farrer and Clarion are supporting MedTechs with their legal advice and protection.

"We support a number of clients by making sure that their intellectual property is adequately protected. So, if they are innovating, we can file the relevant patents for them. We can make sure they've got the rights or protections in place to keep their software confidential if that's what they need to do. We can make sure the user interfaces that are externally facing get properly protected by way of design or by way of a patent. It's all about crystallising that intellectual property and making sure it's adequately protected.

One of the unique ways we help is through training. We like to get information into companies and have done work with the National Institute for Health and Research.

We try and do regular training videos to try and get the message across so that these opportunities are not lost, and when we work with a particular company, one of the things is we go in and we do workshops with the individual inventors, clinicians, and medics, and just talk them through the opportunities. We don't wait for them to come and say this is what I want to protect because many companies, particularly small ones, don't actually know enough about patents to do their own invention discovery."
Virginia Driver, European Patent Attorney, and Director of **Page White Farrer**

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CLARION LEGAL PROCESS:

ONE.
THE FIRST THING WE GENERALLY DO FOR OUR CLIENTS BEFORE THEY INVEST SIGNIFICANTLY IN DEVELOPMENT IS TO SUGGEST THAT WE ARRANGE FOR CLEARANCE SEARCHES TO BE CARRIED OUT TO TRY TO IDENTIFY ANY BLOCKING IP THAT COULD LIMIT THE SCOPE FOR OBTAINING A PATENT OR DEVELOPING A PRODUCT THAT WOULD INFRINGE THIRD PARTY PATENTS.

TWO.
WE ALSO LOOK AT THEIR CONFIDENTIALITY PROTECTIONS TO ENSURE THAT THERE ARE NO GAPS THAT MIGHT RENDER AN INVENTION NOT ELIGIBLE FOR PATENT PROTECTION OR DETER OTHERS FROM TAKING ADVANTAGE OF A CLIENT'S WORK. WE CAN THEN PUT APPROPRIATE CONFIDENTIALITY OBLIGATIONS IN PLACE.

THREE.
WE SUGGEST PRAGMATIC SOLUTIONS SUCH AS PUTTING IN SOFTWARE REDUNDANT CODE TO ENSURE THERE ARE FUTURE MARKERS IF THE CODE GETS COPIED.

FOUR.
ANOTHER THING WE CAN DO IS PUT THE CLIENT IN CONTACT WITH POTENTIAL FUNDERS, INVESTORS OR MENTORS WHO ARE LOOKING TO SUPPORT COMPANIES OF INTEREST. THIS CAN BE BY WAY OF PROVIDING FINANCIAL AID OR MENTORING THEM. AS PART OF THIS PROCESS, WE CAN INTRODUCE CLIENTS TO TAX ACCOUNTANTS TO MAKE SURE THEY ARE GETTING ADVICE ABOUT CLAIMING R&D TAX AND/OR PATENT BOX RELIEF.

FIVE.
WE ADVISE DIRECTORS AND SHAREHOLDERS ON HOW THEY CAN SET UP THEIR COMPANY IN THE WAY THAT BEST PROTECTS THE COMPANY AND ITS ASSETS, IN PARTICULAR BY PREPARING APPROPRIATE SHAREHOLDER AGREEMENTS AND SERVICE CONTRACTS. IF YOU HAVE THE PROPER CONTRACTS IN PLACE, YOU CAN MAKE SURE THE COMPANY'S ASSETS ARE FULLY PROTECTED.

SIX.
WE ADVISE CLIENTS ON WHAT AGREEMENTS THEY NEED TO PUT IN PLACE TO MANAGE THE PROTECTION AND OWNERSHIP OF IP, MAKING SURE THAT THE OWNERSHIP LIES WITH THE COMPANY WHERE POSSIBLE OR (IF NOT) THAT THE COMPANY HAS IN PLACE ALL OF THE LICENCES IT NEEDS TO USE IP OWNED BY THIRD PARTIES.

TO ASSIST WITH CLIENTS' COMMERCIAL ACTIVITIES, WE PREPARE COLLABORATION AGREEMENTS, R & D AGREEMENTS, IP LICENCES AND ASSIGNMENTS.

SO, WHETHER THEY'RE SELLING PRODUCTS OR OFFERING SERVICES, SOFTWARE DEVELOPMENT SERVICES, MAINTENANCE SERVICES, WHATEVER THEY'RE DOING, THAT THEY'RE BEING PAID FOR, WE CAN HELP THEM MAKE SURE THEY'RE DOING THAT INTHAT IN IN A PROTECTED WAY.

SEVEN.
WE CAN ALSO HELP OUR CLIENTS TO RESOLVE ISSUES RELATING TO THE VALIDITY OF IP RIGHTS OR ABOUT WHO OWNS AND/OR HAS THE RIGHT TO USE A PARTICULAR IP RIGHT. IN ADDITION, WE HELP OUR CLIENTS TO REGISTER THEIR TRADE MARKS, DESIGNS AND PATENTS AROUND THE WORLD. WE MANAGE CLIENTS' PORTFOLIOS IN OVER 75 COUNTRIES. ONE OF THE PARTNERS IN OUR IP TEAM IS A CHARTERED TRADE MARK ATTORNEY, WHICH IS QUITE UNUSUAL IN FIRMS OF SOLICITORS."

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15 THE GREEN AGENDA



Climate change poses a threat to both our planet and our health, so its pinnacle that the NHS is moving towards a greener future. In 2020, the NHS[28] became the world's first health service to commit to reaching carbon net zero, to achieve by 2040 for the emissions they directly control.

As part of this transformation, they are looking to rethink how they operate, developing a more circular model that includes investigating every aspect of their scope 1, 2 and 3 emissions and footprint.

This is no small feat considering the scale and magnitude of the NHS today, but what will it take to truly achieve this? Adam Levick, Group Marketing Manager, Elemental Healthcare, gives his opinion on the matter.

"It's possible for the NHS to achieve this goal, but the journey to become Net Zero by 2040 must continue to gain momentum. Industry and the NHS must come together and adopt a partnership approach to achieve this ambition as societally we all become more aware of the footprint generated from healthcare provision.

The NHS isn't alone on this journey, Elemental Healthcare as I'm sure many other organisations across the industry are embarking on their own journey to Net Zero, with an ambition to achieve this by 2030. To support the NHS in achieving its 2040 Net Zero target, industry must continue to have a pathway which allows the evaluation by Hospitals and Trusts of the innovation available, collaborating to achieve mutually beneficial outcomes. Across the NHS it's clear to see that there are individuals and groups who are empowered to drive sustainable change and leave a lasting legacy. The support to them must continue."

One area that needs to be addressed is waste, in particular surgical waste.

We spoke to Elemental Healthcare who deliver creative solutions for surgical instruments for minimally invasive surgeries. Their unique instruments replace the NHS' reliance on single-use plastic. Adam Levick explains why operating theatres generate a disproportionate amount of waste.

"One area of waste generation in operating theatres has been through the trend in generations gone by to move away from fully reusable to single use devices. This subsequently generates a significant amount of clinical waste as the devices in question are often constructed from plastic. Therefore, it's an area which healthcare providers could immediately review and subsequently deliver a more subsequently deliver a more sustainably orientated clinical service. For context, medical equipment is estimated to account for 10%[1] of the NHS Carbon Footprint Plus and the operating theatre has been identified within that as a key carbon hotspot."

He goes on to discuss how their technology is looking to address said issue.

"We have a range of innovative Resposable® products that help healthcare professionals reduce the volume of clinical waste generated through the consumption of traditionally plastic based products.

In Laparoscopic surgery for example, we offer a range of devices such as Port Access Systems, Laparoscopic Instrumentation and Clip Appliers, all staples of Laparoscopic surgery. Constructed containing both single use and reusable elements, collectively delivering the advantages of both into one hybrid concept, offering significant environmental and financial opportunities.

Our technology is all underpinned by quality and performance, ensuring that any healthcare providers who make the transition, not only drive a more sustainable and profitable clinical service, they have the assurance that the adoption of products also won't impact

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negatively on the users experience or patient outcome."

Waste through usage is not the only area of concern, there is also a form of waste that is caused from the lack of traceability of assets. Ken Moran explains this further.

"From an asset tracking perspective, it avoids over-procurement. Because when assets cannot be located but there is still a demand to use the asset, it has to be replaced. Most Trusts are also guilty of over-procuring medical assets and equipment in the expectation that a proportion will go missing when given to patients. We have also had use cases where a customer has asked for the IoT tags to be reusable and washable, so that if the assets need to be replaced or retired, it can be applied to another, increasing the lifecycle of the tags.

Another opportunity where we can aid the NHS' Green Agenda is to use the sensors to monitor environmental conditions such as carbon dioxide levels or light".
Ken Moran, Business Growth Director, **Kinsetsu**

For many operating in the MedTech space, especially those that are producing physical assets, minimising their carbon emissions is going to be a major undertaking and will be difficult to know where to begin. However, research is finding that MedTechs are more frequently seeking expert support to achieve their sustainable journey.

"We see businesses increasingly getting assistance from professional advisors, including legal services providers as well as technical consultancies specialised in sustainability and ESG to help in setting up specific strategies, processes and policies to identify areas of improvement of sustainability credentials, including driving further cost and emission footprint efficiencies.

The increase in regulation around sustainability including emissions reporting are key drivers to push companies to better their emissions footprint and credentials. Research suggests that a company that takes sustainability seriously and that has put or is putting in place robust ESG strategies and policies will do financially better in the future compared to companies who have not paid sufficient attention to ESG."
Christian Hellmund, Partner, Energy, **Clarion**

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MEDICAL MANUFACTURING

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It isn't just the application or use of medical devices either, it all begins with the creation. Christian from Clarion explores how the manufacture of the MedTech devices is the first step when it comes to sustainability. The sustainability in the NHS and thereby the MedTech market is increasingly under pressure and to remain competitive MedTechs need to consider their eco-credentials.

"The trend that we are seeing seems to be towards increased requirements and regulation relating to reporting on sustainability and ESG related matters. By comparison to the UK, more stringent ESG reporting requirements already apply in the US under their stock exchange rules - reporting not only includes what impact a company's emissions footprint has on the environment, but also what impact the environment, particularly climate change, has on a company. This is particularly important for companies that have physical assets such as manufacturing facilities, warehouses etc and where such assets are located in flood risk areas or where there is history of occurrence of hurricanes for example. Importantly for the company, especially larger and listed ones, the sustainability reporting will then feed into the company's investor scoring. Some of those developments are making their way into the into the UK and quite a few companies already look ahead and commit to some voluntary reporting which may become mandatory in the future. Further increased regulation. The new Corporate Sustainability Reporting Directive ("CSRD") expands the number of companies that have to report ESG information, broaden the categories and types of ESG information that companies must report on, mandate a "double materiality" analysis and introduce obligations for third parties to provide assurances. The CSRD, under certain circumstances, also applies to Non-EU companies, so the UK MedTech sector should take these new requirements seriously. "
Christian Hellmund, Partner, Energy, **Clarion**

Christian delves further into what MedTech companies could action to minimise their carbon footprint.

"There is unfortunately not "one size fits all" answer to this and it will very much depend on the company itself, its corporate structure, asset base, energy requirements, current emissions footprint as well as future ambitions, outlook and strategy of the business. Doing nothing in respect of its sustainability credentials, emissions footprint and wider ESG strategy is no longer an option."

1. ENERGY SOURCES

Having the right energy procurement strategy will play a vital part in the decarbonisation of MedTech companies, their assets, estates and supply chain. For some companies, on-site or near site generation (as a capital project or off balance sheet solution via an energy services/management arrangement) might be an option, for others the procurement of low carbon energy produced off-site elsewhere via a corporate, sleeved or synthetic PPA may be more suitable.

2. INTERNAL PRACTICES

Internally, companies should consider what measures they can put in place to minimise environmental impact looking at its own assets and staff - reduction of waste, promotion and increase of recycling targets, putting In place salary sacrifice schemes for electric vehicles (EVs), making the right decisions choosing pension providers for its employees, investing into a more sustainable future - these are just a few examples, however there are lots of areas of "low hanging fruit" that can help to make a real positive impact on a company's sustainability credentials.

3. SUPPLY CHAIN

Another key area to minimise environmental impact is a company's supply chain and an assessment of the emissions footprint of its key suppliers and partners. Does the MedTech work with suppliers and partners who take sustainability and ESG seriously? Can they obtain contractual commitments from your suppliers and partners which have a positive environmental impact?

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THE FUTURE OF HEALTHCARE

The future of healthcare is changing. MedTechs around the world are innovating boldly and healthcare is set for a significant restructure. Whilst barriers remain, so do opportunities for large-scale innovation to improve the future of patient care.

Our esteemed industry experts foretell their predictions for the sector surrounding medical technology; discussing challenges and opportunities for the sector to thrive.



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“There’s brilliant people and brilliant technology out there. The sky’s the limit. Patients are really keen to get better and need to get better and even the amount of time wasters you get now is so low compared to when I started medicine, because there’s just no space for them anymore. When you tell them, we’ll see you in three weeks, they can’t be bothered. It’s the real genuine patients that are hanging on for those appointments.

I think, as an unpopular opinion, the NHS needs to be privatised to a certain extent. Pretending that the NHS can survive as it currently is, it’s just romanticising something that hasn’t worked for a long time now.”
Dr Abdullah Albeyatti CEO of **Medicalchain**

“MedTech utilisation will have become the norm!

The patient experience will be of a fully joined-up service with no sense of fragmentation. People will be empowered with all the knowledge they need to manage their health, follow their treatment plans and prevent serious health events as much as possible.

Access to health services will be easy.”
Tim Ringrose, CEO, **Cognitant**

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“There is a significant trend toward prevention and diagnostic technology with a particular focus on wellness and “nudges.” The sector is keen to encourage people to live healthier lifestyles and be more aware of their wellbeing, as a smaller early intervention can significantly impact down the road. These areas also improve quality of life and increase lifespans.

There is also pressure for a similar shift from the healthcare system – a change from reactive to proactive, following a clear strategy. There are challenges in doing this within a publicly funded system, such as the NHS, but it can be done. A successful approach would be a public-private partnership, co-designed from the start with stakeholders from across the sector brought in.”
Dr Martin Stow, Chair and Director of **Nexus (University of Leeds)**

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“As pressures increase on healthcare systems and traditional models of care cannot keep up with demand on the service, MedTech will play an increasingly important role. Healthcare systems of the (not-so distant) future will rely heavily on MedTech for earlier, less resource intensive diagnosis, systems to support monitoring in out-of-hospital settings, and more patient specific treatment protocols.”
Yolanda Hill, Business Development Manager, **Neuronostics**

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“The long-term goal of the healthcare industry should be a wellness service, moving into a prevention model rather than the reactive treatment model we are currently in. It should be about encouraging people to live a healthy lifestyle, looking to the long-term future rather than short-term needs. This is all built on education and ownership over one’s own health. There are so many innovations that can help patients but it’s really about focusing on what the problems are and making use of the expertise in the healthcare workforce.”
Dr David Rawaf, Clinical Excellence Lead, **Inovus Medical**

“Healthcare is inherently moving towards a proactive approach; we know that the single biggest lever in saving lives lies in early detection. We have seen that the NHS is particularly focusing on early diagnosis of cancer. For example, the five-year survival rates for the top five cancers are significantly higher at Stage 1 versus Stage 4, depending on the type of cancer; early detection of cancer may lead to more cures or longer survival.

We can try and extrapolate the outcome of some of the existing initiatives;

- **AI Based and Digital technologies will be at the centre of a physician’s work; such tools will allow physicians to identify and prioritise high risk patients while selecting the patients who will highly benefit from different drugs.**
- **The underlying foundation for such streamlined health delivery will be advances in biotechnology. Molecular testing will become largely affordable, accessible and routine across different diseases; it will be the peak of precision medicine!**
- **With this blow-up in access to information, we anticipate that there will be increased patient involvement characterised by collaboration and transparency between healthcare and patients.”**

Dr Pahini Pandya - Founder, CEO, **Panakeia**

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CONCLUSION

Healthcare is fundamental to us as a society and to ensure patient care progresses to a proactive model, current practices must be re-invented and next-generation medical technology must sit at the heart of our approach.

Technological innovation could enable faster diagnosis, minimise the impact of surgeries, provide transparency over operations or develop more sustainable practices.

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MEDTECH AND HEALTHTECH INNOVATORS WILL BE PIONEERING THE FUTURE OF PATIENT CARE

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