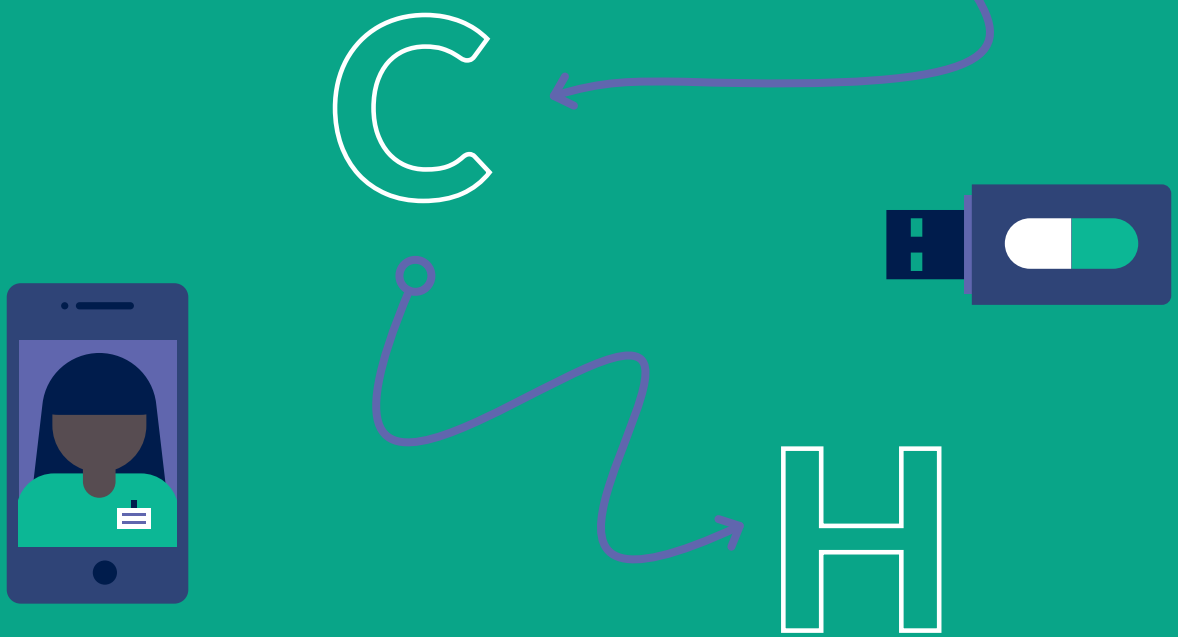
Fit for the Future

Digital Technology Roadmap



Royal College of General Practitioners

#FutureVisionGP

Fit for the Future
Digital Technology Roadmap

#FutureVisionGP

RCGP Royal College of General Practitioners

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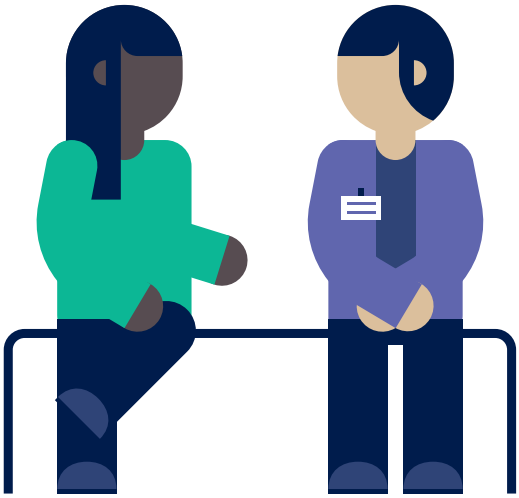
Executive summary

GPs have always been at the forefront of adopting new technology in the NHS. Many emerging digital technologies have already been adopted by digitally-savvy practices and developments in artificial intelligence (AI), genomics and robotics all present opportunities to revolutionise patient care.

General practice is ready to embrace these opportunities but needs wider system change to ensure this can happen safely and sustainably. GPs and their teams must be at the heart of this system change.

The RCGP's *All Systems GP* manifesto published in April 2019 highlights the importance of 'getting the basics right' first –investing in upgrading and modernising general practice IT infrastructure, systems and software, as a priority before implementing new, innovative forms of technology which will advance general practice.

In May 2019, we published our vision for the future of general practice (*Fit for the Future: A vision for general practice*). This includes a vision of a digitally-enabled general practice, offering improved holistic and personalised care, reducing health inequalities, supporting continuity and self-care and making GPs' working lives easier and more rewarding.



This roadmap outlines what actions are required to achieve our vision. We have grouped these under the following four key outcomes:

IT infrastructure and software

All practices will have modern, interoperable IT facilities with high-speed broadband connection and access to a shared patient record which documents patients' interactions across the health system.

Workforce, education and training

GPs and their teams will be confident and competent in using various types of technology in their day-to-day practice, from virtual consultations to remote monitoring and AI diagnostic tools. Patients and carers will understand what digital healthcare services and tools are available and appropriate for them, including how to access and use these tools and services as part of their self-care and self-management, with the support of their GP. As general practice moves towards collaborative working, there will be more specialist roles (for example data analysts and data scientists) in primary care.

Engagement with digital innovation

GPs and the wider practice team will have access to an array of digital tools and services which meet the needs of general practice and its patients, as a result of co-creation between patients, GPs and innovators. A clear and consistent process will be in place to enable the efficient adoption of safe and effective digital innovations into general practice.

Evaluation and regulation

All technology applied to general practice will be rigorously evaluated and regulated against a common set of standards, which are underpinned by strong ethical principles and tailored to stages of the innovation and development process, keeping pace with the rate of technological innovation.

Glossary

Application Programming Interfaces (API): A set of routines, protocols and tools for building software applications which specifies how software components should interact.

Integrated Care Systems (ICS): A collaborative system of working in England where NHS organisations in partnership with local councils and others, take collective responsibility for providing seamless, coordinated care, managing resources, delivering NHS standards and improving the health of the population they serve.

Medicines and Healthcare products Regulatory Agency (MHRA): An executive agency, sponsored by the Department of Health and Social Care, which regulates medicines, medical devices and blood components for transfusion in the UK.

Natural Language Processing (NLP): A branch of artificial intelligence that helps computers understand, interpret and manipulate human language. NLP draws from many disciplines, including computer science and computational linguistics, in its pursuit to fill the gap between human communication and computer understanding.

NHSX: A unit dedicated to driving forward the digital transformation of health and social care by bringing together teams from the Department of Health and Social Care, NHS England and NHS Improvement to lead policy, implementation and change.

Primary Care Networks (PCNs): PCNs form a key building block of the NHS England Long Term Plan, bringing general practices together to work in geographical networks covering populations of approximately 30–50,000 patients.

Professional Records and Standards Body (PRSB): The PRSB was established in 2013 to develop and help implement standards for the structure and content of health and social care records. It is a membership organisation representing more than 750,000 frontline clinicians and care professionals, as well as patients and the public.

Sustainability and Transformation Partnerships (STPs): Areas covering all of England, where local NHS organisations and councils established shared plans for improving health and care in the areas they serve.

Understanding Patient Data: An independent patient data taskforce which was set up in response to the Caldicott recommendations, to support better conversations with the public, patients and healthcare professionals about how health and care data is used.

The digital transformation policy landscape

An overview

In 2018, NHS England published a Long-Term Plan[1] which established a set of key digitalisation milestones for the next five years including the ability for every patient to have access to online digital primary care consultations and all clinicians to be able to access and interact with patient records and care plans wherever they are. NHS England and NHS Improvement have committed to ensuring a digital offer is available to general practice – core capabilities will be centrally funded and available from a national framework of centrally accredited suppliers from 2021.[2]

In 2018, **NHS Scotland** published its *Digital Health and Care Strategy*[3] which recognised digital technology as a crucial part of service transformation and outlined a transition process to transform Scottish healthcare, including rolling out digital maturity assessments across Scottish health and social care, and working with the Scottish Government's Digital Connectivity team on technology opportunities (for example rolling out Wi-Fi and addressing bandwidth issues). The strategy also established the development of a National Digital Platform to enable data sharing and interoperability of existing and emerging technologies.

In 2016, **Northern Ireland's** Department of Health published its *eHealth and Care Strategy*[4] which centred on several key principles including establishing connectivity across Northern Ireland, ensuring healthcare information is in the right place at the right time and driving innovation and promoting best practice.

In 2015, the **Welsh Government** published its *Digital Health and Social Care Strategy*[5] which outlined how digital tools will enable individuals to have more control over care and improve access to information and services. In September 2019, the Welsh Government announced £50 million of new funding for digital transformation in Wales, including the reshaping of the NHS Wales Informatics Service into a new standalone NHS Wales organisation with Special Health Authority status, and four strategic reviews which will feed into a Wales Digital Infrastructure Plan, a Digital Workforce Plan, a Commercial Strategy and a Communication Strategy.

Barriers to digital transformation for GPs

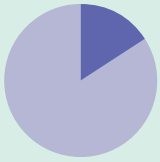
The latest *Savanta ComRes 2019 RCGP England Tracking Survey* (to be published) found that while a large proportion of GPs are now undertaking telephone consultations (85%), administering online prescriptions (77%) and providing online appointment bookings (76%), newer opportunities have a much lower rate of adoption. Only 16% of GPs use online symptom checkers for patients, 11% provide online triaging and 3% offer Skype consultations.

GPs reported that the key barriers to adopting these newer opportunities were a lack of IT infrastructure, insufficient funding and training, not enough time to adapt, concerns about safety, effectiveness, quality and liability, unequal access and lack of a legal framework governing newer technology.

85%
GPs undertaking telephone consultations

77%
GPs administering online prescriptions

76%
GPs providing online appointment bookings



16%
GPs using online symptom checkers for patients

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IT infrastructure and software

All practices will have modern, interoperable IT facilities with high-speed broadband connection and access to a shared patient record which documents patients' interactions across the health system.

Deloitte's 2019 publication *Closing the Digital Gap: Shaping the future of UK healthcare* reported findings from a survey of 1,500 clinical staff across the UK, including GPs, nurses, allied health professionals and interviews with senior stakeholders across the health ecosystem. Deloitte reported that the majority of senior healthcare leaders rated funding as the most pressing challenge facing the NHS's digitalisation journey, followed by leadership and interoperability.[6]

Funding so far has been concentrated on the more digitally mature NHS trusts and the recommendations in current strategies and plans across the four nations need more specificity and costing. Policymakers must therefore prioritise funding support for bringing IT infrastructure in primary care up to scratch to enable digital services and ensure this funding flows efficiently to reach practices.

In England, the Estates and Technology Transformation Fund (ETTF) was established in 2015 and allocated £900 million (revenue and capital funding) to upgrading general practice facilities and technology across the country between 2015/16 and 2019/20. As of 2018/19, approximately £527 million has been spent from the ETTF. It is not clear how much of this has been spent on technology or, indeed, whether there is sufficient funding remaining to deliver the necessary upgrades over the next 2 years. The latest RCGP tracking survey found that only 10% of GP respondents received funding from the ETTF, with 16% having been declined and 31% not knowing what the ETTF was. The proportion of respondents who view technology as a contributor to running a practice being financially unsustainable rose from 13% in 2016 to 28% in 2019. Fourty six percent of respondents saw eligibility criteria for additional funding as a key issue.

Future funding schemes for upgrading IT infrastructure in general practice must consider reasons for the low uptake from the ETTF and other lessons learned from this scheme. We would like to see the new GP IT operating model in England (due to be published in 2020) augmented with adequate annual investment in equipping all practices with modern IT infrastructure and maintaining a high standard of quality and efficiency via rolling infrastructure upgrades, so that practices across urban and rural settings are able to digitise at a pace that keeps up with evolving digital technologies.

Funding also needs to also be allocated towards enabling practices to acquire newer, more advanced technology such as AI diagnostic tools and natural language processing (NLP) software, accounting for future price increases for these products.

1. Ensure all practices have the necessary equipment and facilities for enabling various IT capabilities and digital access

For GPs and their teams to be able to access information from across the health system and provide patients with access to digital care such as telehealth and virtual consultations, practices need to be equipped with the necessary equipment and facilities to enable the safe and efficient delivery of these types of care. While there are several initiatives which are beginning to improve the state of IT infrastructure across the NHS, many practices are still not equipped with basic IT facilities such as high-speed broadband connection, fully-functional Wi-Fi and upgraded computer hardware. Deloitte's 2019 report stated that interviewees rated the current state of NHS IT infrastructure as just 5/10 on average, with the rating for primary care as 4/10 compared to 7/10 for secondary care.[7]

Digital and data-driven technologies are continually evolving and gradually entering healthcare service provision. However, the NHS is still lacking in the basic infrastructure which is needed to underpin these more advanced forms of technology. Fully-functioning Wi-Fi and the early adoption of upgraded network technology such as 5G should be standard facilities throughout the NHS.

In April 2019, Secretary of State for Health and Social Care Matt Hancock committed to delivering high-speed broadband via fibre-optic cable to all practices in England, with 70% of NHS organisations using fibre-optic broadband by August 2020.[8] There have not yet been any plans announced by the Department of Health and Social Care (DHSC) or NHSX outlining details for the delivery of this commitment. An RCGP analysis found that approximately 50% of practices across the UK currently have access to ultrafast broadband (>=300Mbs). However, of these practices, only 12% are rural. While the 70% target by 2020 seems sufficiently stretching, we have significant concerns that even if it is achieved, rural practices will remain far behind and existing health inequalities will be amplified.

The Scottish Government has achieved its initial target of providing 'superfast' broadband (download speeds greater than 24Mbps) to 95% of premises across the country via the Digital Scotland Superfast Broadband programme, but it is unclear how it is going to fulfil its pledge of delivering superfast broadband to *all* premises by the end of 2021. Audit Scotland's 2018 report notes that while overall broadband speeds have increased across Scotland, rural premises still lag behind urban areas with around 25% of rural properties not achieving speeds of 10 Mb/s.[9]

In Wales, the North Wales Economic Ambition Board recently set out a plan for investing up to £7 million from Wave 3 of the UK Government's Local Full Fibre Networks (LFFN) programme, to install ultrafast broadband services to up to 400 more public sector sites (including over 100 GP surgeries in both large towns and small villages) by the end of 2020.[10]

While we welcome the initiatives underway across the UK, it is important that national governments commit to targets which reflect the particular needs of certain regions, some of which need digital connectivity more urgently to overcome lower workforce numbers and the distances patients need to travel to see a GP in person. These regions should be prioritised within the coverage targets and funding allocations. It is also important to take an open, flexible approach to connectivity rather than narrow every region to a specific connectivity method. For example, fibre-optic broadband connection may not be the best option for practices in very remote areas due to excessive costs, but 5G may present a more practical solution for these areas.

Actions:

- The *quantum* of funding for upgrading IT infrastructure in all practices needs to be urgently reviewed, to ensure it is sufficient to cover the costs of upgrading facilities in practices in the most remote and rural areas, and support rolling infrastructure upgrades to ensure GP IT is never out of date. Funding schemes should also be in place in each nation to ensure an *efficient direct flow* of funding to practices for upgrading IT equipment and facilities, including interoperable IT systems, modern consulting rooms, high-speed broadband connectivity and local 'in-house' IT support.
- All four governments should commit to delivering high-speed broadband connectivity to all practices by 2023.

2. Implement interoperable GP IT systems and software in all practices by end 2022

IT infrastructure not only refers to tangible hardware and equipment, but to the *interfaces* between different types of systems so that they speak to each other in a way that facilitates the efficient supply and acquisition of information. Currently within the NHS, these Application Program Interfaces (APIs) are either absent or very difficult to use. Interoperable systems and software are urgently needed to enable better coordination of care and eliminate the unnecessary duplication of work, particularly time spent by patients repeating information which they have already provided in other health

care settings. Incompatibilities between systems and software also poses significant risk to patient safety, for example through delays to the transfer of test results.

It is vital that primary and secondary care settings are digitised together, to ensure interoperability between these two settings is embedded by system developers. Interoperability is also essential across the health and care sector and needs to extend to networks, clusters, federations and the like. The reliable flow of data between applications and platforms will critically impact the use of AI tools in care and must be a key consideration for implementing new IT systems in general practice.

In England, the GP IT Futures programme is expected to be a key enabler of interoperability, as it aims to create a new environment for the supply of clinical IT systems for general practice, which supports the transformation of primary care. The GP IT Futures Framework has challenged technology suppliers to develop new and innovative IT products and services that follow set standards on interoperability and data access for general practice, following a £500m Invitation to Tender which was issued by NHS Digital in May and closed in August, with a range of existing and new suppliers expecting to be available on the new framework.[11] The framework is aimed at ensuring all IT systems and software in GP practices meet minimum connectivity standards and can communicate with each other, promoting modularity and the movement of patient data to cloud services. It is due to come into force in January 2020, following an assessment and assurance process.

Similarly, in Scotland, the GP IT Managed Services Framework is intended to offer significant benefits to primary care and patients, including interoperable GP IT systems and services. The procurement process for this framework is managed by NHS National Services Scotland (NSS) and overseen by the national GP IT Re-Provisioning Project Board.[12] The first date of deployment is expected to be in winter 2020.

The Local Health and Care Record Exemplars (LHCREs) programme launched in 2018 in England is developing a new information sharing environment that will help improve health and social care services across the country. It requires LHCREs to demonstrate the ability to interoperate with each other using common standards for information and transmission and adhere to a robust information governance framework including national data opt-out requirements. NHS Digital's GP Connect programme is supporting the development of products which will enable different systems to communicate so that clinicians in different settings can view a patient's GP practice record, manage appointments and access data on the patient's medications and allergies. This programme will support the development of PCNs and the LHCRE approaches which are being spread across the country.

The LHCRE programme and NHS Digital's Data Services Platform will also be complemented by 'Digital Innovation Hubs' which have been promised by the Government as part of the delivery of the UK Life Sciences Industrial Strategy.[13] These hubs are expected to connect regional healthcare data with genetic and biomedical information across the country and make data from some of the UK's major health providers accessible in one place for the first time. We welcome all these programmes and initiatives in England. However, it is critical that all these workstreams fit together appropriately to ensure consistency and avoid duplication.

Programmes of work which are developing interoperable IT systems should also carefully consider how to address the movement of patient information across borders, where patients are being referred to GPs and hospitals in different nations; for example, across the England and Wales border.

Actions:

- The NHS should prioritise the implementation of GP IT procurement frameworks which require interoperability (between GP practices and between primary and secondary care settings) as a core specification for all IT systems in GP practices.
  - This action should build upon NHS Digital's GP IT Futures framework in England and NSS' GP IT Managed Services framework in Scotland, which are both currently under development and due for launch in 2020. The delivery of these frameworks is critical and should not subject to any delay, given the interdependencies with GP access to a shared patient record, the roll-out of the NHS App in England and the successful implementation of a common set of technology and data standards for clinical IT systems across the UK.
  - Greater cooperation and coordination between NHS England and the devolved health administrations is needed to account for smaller economies and how to attract investment in these markets – this is crucial to enabling access to interoperable IT systems for practices in the devolved nations and working across national borders.
- The NHS should provide sufficient funding to practices to ensure they can purchase IT systems and services from new GP IT procurement frameworks, accounting for annual price increases by accredited suppliers.

3. Establish robust, secure platforms across general practice for accessing a shared electronic patient record

A shared electronic patient record across the NHS has the potential to improve the quality and safety of patient care, enabling better coordination of care across the broader health system with increased patient involvement in their own care. It can also save a significant amount of time spent by clinicians and staff across the health and care sector, on inputting, updating and transferring patient information.

A shared electronic patient record would also relieve patients with multiple conditions from the burden of repeatedly providing information about their situation to different health care professionals across the NHS. Relying on patients to provide accurate information about what medications they are on, and of the outcomes of different healthcare appointments they attend, presents significant risk of error in the prognosis and prescriptions a clinician makes, which could be effectively eliminated via the use of a shared electronic patient record.

Understanding Patient Data's 2019 public attitudes research study found that in London, the public already expect their medical records to be available to the full range of NHS clinicians who provide direct individual care – the research to date shows a degree of genuine surprise amongst the public that this expectation is not routinely met, and that different health professionals in different places within the NHS are not already able to access health records for the purpose of individual care.[14] The NHS is lagging behind other European countries like Estonia and Finland which are already using a shared electronic patient record.

From the perspective of GPs and their teams, a shared patient record and platforms for accessing it, should have the following characteristics:

- It should be **accessible**, ideally in **real-time**, to GPs, consultants, nursing staff, Allied Health Professionals (AHPs) and other clinicians involved in the patient's care and treatment.
- **Interoperability** with other platforms and systems, including **secondary care and out of hours / urgent care** systems, so integrated patient data is visible to GPs and other health care professionals working in these settings, as well as **community care** professionals involved in the patient's care.
- It should be designed with the intention of strengthening and maintaining **continuity of care** for patients, particularly those living with multiple, long-term conditions.
- **Security of confidential patient information** is paramount for any electronic patient record, so stringent and auditable permission controls for a single, shared electronic patient record must be a requirement. Appropriate safeguards such as 'safe spaces' must also be

embedded into any shared electronic patient record to protect sensitive patient information (for example sexual health information) and to ensure information relayed to a GP by vulnerable patients (for example victims of domestic abuse) is not accessible by perpetrators of abuse.

- **'Patient readiness'** should also be a key criterion to ensure the data and results accessible to patients via a shared electronic patient record are easily interpretable and disclosed in an appropriate sequence and manner. This should take into consideration the way a GP would usually relay information about prognosis, implications and treatment to a patient.

Most NHS primary and secondary care providers now have some sort of electronic health record (EHR) in place – 98% of clinical staff in GP practices said they use EHRs.[15] The rate of adoption of EHRs was found to be highest in Northern Ireland, which may be linked to the perceived success of its Electronic Care Record (NIECR) and its ease-of-use portal which can be accessed by a variety of healthcare professionals from primary, secondary and social care.[16] In January 2018, 95% of NIECR users confirmed that the platform has saved them time.[17] The ECR is also linked to out of hours GP systems and uploads a minimum data set from GP records (including medication and allergy information). However, it does not share GP consultation information and does not currently offer patients with support and immediate advice when interpreting data and test results. The Encompass programme is health and social care wide initiative in Northern Ireland to integrate digital health and social care records. It is anticipated that the programme will be implemented in 2021 with full roll-out across the entire system, including general practice, by late 2023. Active consideration must be given to the opportunities, challenges and risks for GP service delivery as part of the Encompass programme.

In 2018, the Welsh Clinical Portal was launched to provide a digital workspace for clinicians to share and display patient information from a number of sources, including the Welsh GP record. The record can be accessed by health professionals caring for a patient wherever they are in the country, and patients give consent for the healthcare professional to access their record every time it is needed, with access being automatically monitored.

In Scotland, a shared care record project is currently underway which aims to link up patient information from four of the country's health boards, using Orion Health's Population Health platform.[18] The first phase of the project has been rolled out which enables clinicians to access acute patient information. The next step will be to make GP and social care data viewable alongside the acute patient information.

In England, the LHCRE programme in collaboration with the BMA's Joint GP IT Committee and other stakeholders, is sharing patient records on a scale and in a way that has never been done before, centred around the patient and clinicians at point of need. This programme has

the potential to lead the wider NHS into a new era of digital interoperability. However, the programme's timeframes for implementing consistent data standards across each LHCRE (by 2021) and rolling out shared patient records across the entire country (by 2024),[19] are highly ambitious. The Professional Record and Standard Body (PRSB)'s work on the LHCRE programme in England found that there is widespread support for shared electronic patient records, but there is significant confusion about how it will work in practice which is exacerbated by multiple, inconsistent messages from different bodies. The successful development and delivery of shared electronic patient records across the country also relies heavily on the communication and cultural change required to facilitate patient record sharing amongst the profession and by patients (see page 28,29), and on the interoperability of IT systems and software used in practices and in other health and care settings.

The safeguarding of confidential patient information, including information about vulnerable patients, must be a key consideration when designing a shared patient record, which raises the question of what types of information should and shouldn't be shared across the NHS and how advancing technology can not only efficiently share information but protect it. Some other important considerations include the coding of data to ensure consistency and quality, and how data can be accessed and presented in real-time across the different systems, as data is currently locked in organisational siloes. Significant cultural change will also be needed to assure health care professionals and patients that they can safely use the record, alongside investment from the Government to ensure the appropriate infrastructure and expertise is acquired to guarantee that the record is secure.

We welcome NHS England and NHSX's development of a new section in the Health Systems Support Framework to help care providers access and share data effectively. This new section contains a published list of accredited suppliers of electronic patient record solutions to give organisations and Integrated Care Systems (ICS) more confidence in their route to digitisation.[20] The accreditation criteria sets a high-quality bar of functional requirements, including the ability to deliver enterprise-wide solutions as well as more modular solutions, interoperability with other systems to ensure data is available to clinicians at the point of need, and support for the creation of LHCREs.

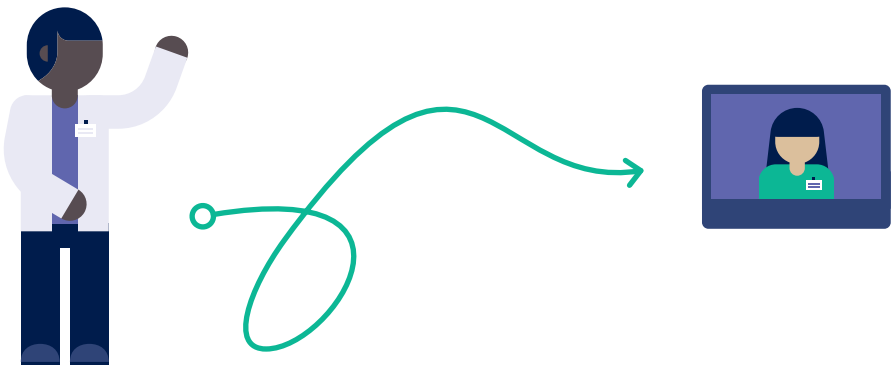
An issue which still needs addressing is the disconnect between purchasers of GP IT/software and the users of it. In the case of healthcare technology, unlike in the consumer sphere, the people who select and purchase technology are rarely the same people who use it. Levers must be in place to ensure that the technology chosen genuinely meets the needs of the end users, with usability and accessibility prioritised alongside functionality, cost and time-to-market. Practices should be involved in the selection of their own IT and software providers, and able to directly contact the providers to

facilitate broader digital integration and transformation (for example integrating electronic health record systems with the NHS App and third-party software providers of online consultations and other digital services) without having to go through the purchaser.

Actions:

- All nations should be aiming to have a shared electronic patient record in place, with efficient access platforms for general practice, by 2022.
  - **England**: NHS England should urgently review the funding and resources allocated to the LHCRE programme. A sufficient level of 'business-as-usual' funding is needed to progress the programme from 'piloting', to achieve the ambitious target of rolling out coverage across the country during 2020–21.
- Current and future programmes of work which are developing or assessing shared patient record platforms should involve GPs in this process to ensure the information presented in the shared record is structured and tailored for general practice. This will help ensure usability by GPs and wider practice team members, avoiding inconsistencies and inaccuracies in data recording, and overflows of information which may slow down processes and further stretch workload.
- The NHS should prioritise and bring forward the delivery of funding and a national framework for digital-first offers to general practice, accounting for the specific prices accredited suppliers are charging and predicted annual increases in prices.
- **England**: NHS Digital and NHS England should prioritise the functionality, implementation and communication of the NHS App (via Primary Care Networks or Integrated Care Systems) as a way of ensuring patients can access their GP record.

Note: This is closely linked and dependent on the successful implementation of the GP IT Futures framework



Workforce, education and training

GPs and their teams will be confident and competent in using various types of technology in their day-to-day practice, from virtual consultations to remote monitoring and AI diagnostic tools. Patients and carers will understand what digital healthcare services and tools are available and appropriate for them, including how to access and use these tools and services as part of their self-care and self-management, with the support of their GP. As general practice moves towards collaborative working, there will be more specialist roles (for example data analysts and data scientists) in primary care.

Technological innovations such as AI, genomics, virtual reality and robotics are already in use in the NHS, and new tools and services are constantly developing and transforming the way in which care is delivered. However, digital healthcare remains underrepresented as a requirement of medical training or education for clinicians working within the NHS.

Deloitte's 2019 survey found that primary care clinicians felt least equipped to adopt new technology and were least satisfied with the training provided, compared with secondary care and community care clinicians and staff.[21] Technology will continue to advance and develop in the future, and the integration of digital tools in general practice will increase. New areas of knowledge and skills will be required (for example an understanding of polygenic risk scores in assessing the risk of chronic disease and implementing primary prevention and the ability to use AI algorithms and understand big data) as well as a major increase in digital literacy. The NHS needs to be preparing its workforce to cope and adapt with these changes to benefit their practice and patients.

The commitments made in the NHS England Long Term Plan to the education and training of the workforce, and the planned expansion of the NHS Digital Academy (established as part of HEE's Building a Digital Ready Workforce programme) in response to one of many important recommendations made by the Topol Review,[22] are positive and welcome steps to preparing the workforce.

1. Ensure GPs and teams have access to training, guidance and support in routinely using digital tools in practice, and time to familiarise themselves with new technology

Investing in high quality, fit for purpose technology will only make a difference to general practice and the wider NHS if the implementation of new technology is supported by appropriate staff training, support and guidance. GPs and their teams need adequate time to learn to use new digital tools and devices, alongside change management support for the wider practice team, and ongoing technical support with dealing with issues that may arise in the future.

We acknowledge that effective digital tools and systems should inherently be intuitive and easy to use, therefore should not require in-depth training, but it is important that staff are given the time and space to adapt to using these tools to deliver patient care in a safe way. Guidance for handling failures in technology and ongoing IT support is also vital to ensure general practice is supported in digitising without jeopardising patient access to safe, efficient, quality care.

Various pieces of guidance under development, such as NHS England's Online Consultations Implementation Guidance, direct practices to Sustainability and Transformation Partnership (STP) leads (or equivalent) for information on how to access funding to prepare their staff to adopt new digital services like online consultations software. Accessing funding for training and implementation needs to follow a swift process for digital services to be effectively adopted and integrated into general practice.

Actions:

- Commissioning bodies and health boards should factor in the need for ongoing staff training, change management services and technical support for practices (and associated resources) into the procurement processes for new technology and systems.
- Secured funding should be efficiently funnelled through ICS' or STPs and health boards to practices so they can efficiently prepare their staff to use new technology.
  - In England, regional training hubs should be equipped with the necessary funding and resources to deliver this type of training to practices.

2. Ensure GPs and their teams have basic digital healthcare skills

GPs and their teams will not only need to learn how to use new digital tools but adapt their clinical skills in a way which incorporates new technology in patient care. For example, they may need to alter the way in which they input and process information when assessing and monitoring a patient, as well as modify how they communicate results to a patient based on tools and devices which clinicians and patients are both interacting with during the process.

GP Specialty Training currently covers the effective use of information management and communication systems, with a focus on record-keeping and data governance, but it does not currently include the development of digital healthcare skills.

Trainee GPs have expressed a desire to learn about how to adapt their basic consulting and patient examination skills to safely engage with innovations such as virtual consultations and remote monitoring devices. For example, GPs will need to learn to adapt their consulting and decision-making skills to settings where they can only rely on what they can see or hear (or only hear). They will need to understand at what point during a virtual consultation they should recommend a physical examination of a patient or signpost the patient to other healthcare services, carefully considering the risk management approaches that are attached to these decisions. Training programmes should be developing these basic skills that will be impacted by new technology, before creating and promoting programmes for more advanced types of digital healthcare. Digital healthcare training should be practical and “on the job” (without imposing burdensome assessments on trainees and trainers) rather than standalone induction or online learning sessions, with requirements tailored to GPs at different stages of their career.

Future revisions of GP education and training programmes should incorporate a stronger focus on digital care in general practice and information governance, ensuring GPs are equipped to use systems within the safe operating bounds of that particular system in the context of the additional pressures that may come with more efficient technology and increased access to information. GPs and their teams will need to be prepared to make quicker decisions and deal with multiple data flows and decision matrices alongside real-time communications; they must be trained in searching for and using various types of data, while carefully considering the consequences (both intended and unintended) of relying on information systems in their clinical decision-making and patient care. While we support the move towards embedding data specialists and data controllers into networks/groups, it is crucial that patient data is secure and protected via the appropriate de-identification methods before it is handled by professionals in these roles.

Actions:

- The RCGP and all other relevant educational bodies should adjust GP Specialty Training and CPD to ensure the development of basic digital healthcare skills and knowledge (including virtual consulting skills and information/data governance) for GPs.
  - Any additional digital skills requirements incorporated into GP Specialty Training and CPD should be underpinned by a *comprehensive digital skills assessment* which identifies specific digital skills that need urgent development for GPs to safely and effectively engage with digital technology. The RCGP is currently evolving its CPD strategy to incorporate a focus on the changing learning needs of its members, including around digital healthcare skills.

3. Ensure patients and carers have a sufficient understanding of digital healthcare services and tools and how to access/use them safely

Patient-facing technology is expanding fast, and people are becoming increasingly interested in using digital tools to manage their own health and wellbeing, including wearables and monitoring devices, sophisticated online symptom checkers and remote consultations. Some of these types of digital technology have the potential to reduce demand on the healthcare system, particularly primary care, if designed and used in the appropriate way; however, they also have the potential for patient harm and significant disruption.

The NHS needs to make careful decisions, not only about how GPs and their teams are trained to engage with and recommend these tools to their patients, but also how patients and carers are independently educated and informed about evolving digital healthcare tools and new forms of access to general practice.

The NHS Apps library[23] lists all healthcare apps which have been assessed and approved on a range of criteria including clinical effectiveness, usability, accessibility, interoperability, technical stability and data protection responsibilities. This is a useful resource for patients and carers to understand which apps are safe and reliable to use. However, the assessment process needs to keep pace with evolving applications to protect patient safety and reduce pressures on GPs who are often faced with anxious patients questioning results drawn from various apps. Many patients with long-term conditions such as diabetes, asthma and heart disease, will already have access to self-management programmes. Adapting these programmes to incorporate a focus on the risks and benefits of digital tools, such as self-monitoring devices, could be an efficient way of building greater patient awareness and understanding of digital healthcare services available to them.

Actions:

- Governments across the UK should run national marketing campaigns, in conjunction with the NHS, to inform the public about the different types of digital healthcare services available within general practice and the benefits they provide if accessed and used appropriately. These campaigns should be co-created with GPs to ensure public understanding of digital healthcare services aligns with the way GPs will deliver care with technology as an enabler.
  - The NHS in collaboration with public health organisations can embed patient education about digital healthcare into already established self-management and self-care programmes and ensure practice staff have the time and skills to teach patients how to use self-monitoring devices and other self-management apps and tools.
- Invest in the capacity for rapid assessments and approvals of healthcare apps.
- England: Practices should be guided and supported by NHS Digital with engaging their patients with the NHS App and linking up practice systems to the App to enable patient access to its services (which includes online appointment bookings, repeat prescriptions and access to their own GP medical record).

4. Introduce and embed specialist data skills into general practice teams

In addition to the upskilling of the current mix of GPs, nurses, pharmacists and wider practice team members, consideration should also be given to the desirability of developing new roles in general practice, such as clinical data scientists, medical software engineers, bioinformaticians and digital medicine specialists.

As 'at scale' models of general practice develop, and collaborative working between practices becomes the norm, the ability to conduct population-level data analysis should become routine in general practice. This will require close collaboration between specialised data analysts, clinicians and managers to align population health data analysis with the priorities of general practice, support effective decision-making and avoid further fragmentation.

Actions:

- The NHS should conduct scoping and cost modelling to determine the potential impacts of specialist data roles in general practice and the approximate costs of embedding these roles at specific levels (network/cluster level, system level and so forth).
- Based on the outcomes of the scoping and cost modelling exercise, sufficient funding should be allocated at the appropriate level, to ensure practices are able to recruit and integrate specialist data roles into GP teams.

Engagement with digital innovation

GPs and the wider practice team will have access to an array of digital tools and services which meet the needs of general practice and its patients, as a result of co-creation between patients, GPs and innovators. A clear and consistent process will be in place to enable the efficient adoption of safe and effective digital innovations into general practice.

The Topol Review highlighted that organisational culture is a major factor affecting the adoption of digital innovations in the NHS.[24] An open and inclusive culture with a focus on patient safety and quality of service is of utmost importance as a first step towards delivering digital transformation in general practice. The adoption of digital innovations into general practice should be with the intent of improving patient care and the working life of GPs and their teams.

Given the history of failures in previous information and technological systems within the NHS, and the intensity of the current workload for GPs and their teams, it is crucial that the profession is engaged in the development of digital innovations. The likelihood of the successful adoption of innovations in general practice is contingent on the profession's trust in new technologies, therefore careful consideration needs to be given to involving GPs, their teams and their patients in the design and implementation of new technology and new ways of working. The NHS must realise that digital technology solutions are best adopted when patients and healthcare professionals have created them together. GPs and their teams who have an interest in digital healthcare need the encouragement, support, time and space to participate in the innovation process. At present, an overstretched general practice does not enable this participation and subsequently affects the spread and rate of adoption.

As outlined above, significant barriers to the adoption of newer digital innovations identified by GPs in the RCGP tracking survey included concerns about effectiveness, safety and quality. GPs and their teams need clear avenues for accessing valid information about the effectiveness of new digital technologies (for example a list of accredited suppliers and products/services for various elements of care), identifying which innovations might benefit their practice and how to adopt these services into their practice in a safe way. The NHS Apps library[25] may be used as a foundation for developing this information base, however its scope should extend to other digital tools as well, incorporating information about efficiently adopting these tools into day-to-day practice.

The RCGP welcomes initiatives currently under way across the UK which are trying to foster a culture of innovation within the NHS and general practice, such as the SBRI Healthcare Programme delivered via the Academic Health Science Networks (AHSNs) in England, which aims at accelerating the development of new technology with the involvement general practice and primary care.[26] The Innovation and Technology Tariff (ITT) and Innovation and Technology Payment (ITP) also aim to remove financial barriers to the spread and adoption of innovative technologies.[27]

The RCGP welcomes DHSC's plans to invest in a National Artificial Intelligence Lab which will sit within NHSX in partnership with the Accelerated Access Collaborative, bringing together industry, the NHS, regulators and patient representatives to harness the power of AI to improve the health and lives of patients, and the work of clinicians, within a safe and ethical framework.[28] It is important that initiatives and partnerships like this focus on anticipating and developing tools which GPs and their teams are going to need in the future to *enhance* the unique care they provide.

1. Encourage students, trainees and qualified GPs (and their teams) to participate in the digital innovation process via co-creation and co-production, and drive the adoption of innovations across general practice

Actions:

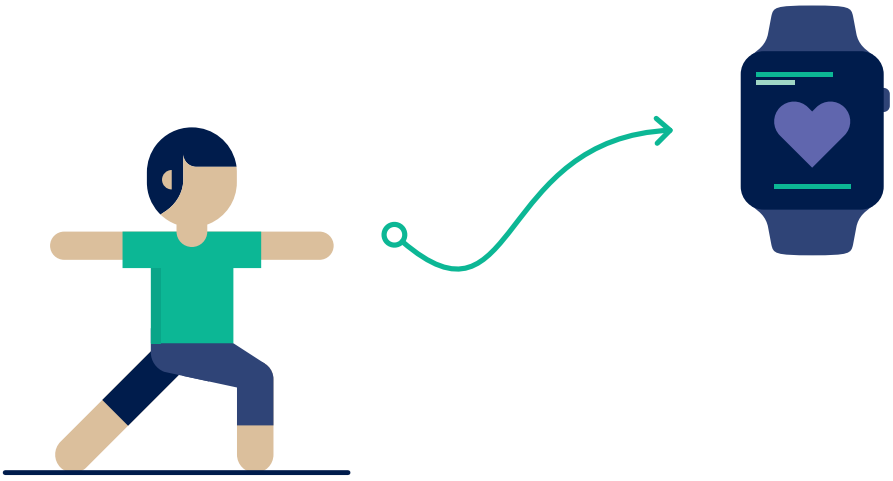
- Invest in the establishment and resourcing of virtual networks and hubs/communities of practice within networks and clusters to connect GPs and wider practice team members (as well as patients) who are interested in digital innovations for primary care.
  - Interested GPs and wider practice team members should be encouraged and supported to get involved in these communities and other initiatives such as digital pioneer fellowships, via dedicated time for participation.

2. Make it easier to adopt effective digital tools and services for general practice

Actions:

- Equip practices with the tools and support services to evaluate the effectiveness of digital innovations for their local areas. Primary care networks, clusters and other networks/groups should have access to support services which can assist with:
  - Modelling the benefits or effectiveness of specific technological innovations, and prioritising the need for different tools and services, taking into account local variants
  - Agreeing contracts to procure new technology or provide digital services, including standards of quality and safety
  - Service redesign to incorporate new technologies and digital access
  - Change management
- These services are similar to those currently provided to CCGs in England by commissioning support organisations.

Actions relating to broader innovation in general practice will be explored in our forthcoming roadmap on research and innovation.



Evaluation and regulation

All technology applied to general practice will be rigorously evaluated and regulated against a common set of standards, which are underpinned by strong ethical principles and tailored to stages of the innovation and development process, keeping pace with the rate of technological innovation.

Evaluation and regulatory frameworks should encourage or permit, rather than stifle digital innovation in healthcare, while reflecting the following **key principles**:

RCGP key principles for digital innovation in general practice

- The secure storage and transmission of confidential patient data, including clear communication to patients about how and why their data is being used and exchanged prior to usage, emphasising their right to opt out where appropriate
- The safeguarding of sensitive and confidential patient information
- Clinical effectiveness; enhances the quality of patient care provided by GPs and their teams, while protecting patient safety
- Tackles health inequalities, or prevents widening them
- Maintains patient access to the trust, clinical presence, empathy and communication of a patient-doctor relationship
- Makes the jobs of GPs and their teams easier and improves clinician wellbeing

- To balance robust evaluation with an encouragement of innovation, **evaluation approaches** should consider the different stages in the development and implementation of a digital service (for example innovation, testing, scale-up/spread). For instance, the earlier developmental stages may focus on addressing questions of user need and whether the tool or service has been built according to set specifications, while early use and routine use stages may focus on whether the service is useable, safe, efficient and being adopted as intended.

Evaluation frameworks should also be tailored in a way which captures both the intended and unintended impacts of a digital service, both in the short-term and long-term where future developments in technology may not be as easily foreseeable.

- The potential impacts of developing digital technologies on **health inequalities** should be a core element of evaluation and regulatory frameworks. Communities that could most benefit from digital access to care are more likely to be the ones who are digitally excluded. Digital skills deficits and inequalities in access to digital technology are two significant barriers to digital inclusion which need to be considered here. Although the number of people in the UK lacking basic digital skills is declining, 20% of the population (approximately 11 million) still lack the basic digital skills needed to use the internet effectively and 4.8 million people do not use digital technology at all.[29] Across the UK there continues to be a divide in access to communication services such as broadband and smartphones. In 2018, 12% of rural premises struggled to access a decent broadband service, compared to only one per cent of urban premises. Affordability further exacerbates an individual's ability to access digital services; three in ten of the most financially vulnerable people live in households that do not have access to the internet. We welcome NHS Digital's *Digital inclusion guide for health and social care* which aims to help providers, commissioners and designers ensure that digital services are as inclusive as possible, meeting the needs of all sections of the population.
- The issue with evaluation and regulation of health and care technology is not so much the lack of evaluation and regulatory frameworks, but the lack of coordination between these frameworks and broader system alignment. In a world of shared information, there is now very little information that is reserved to one profession in isolation. The PRSB is playing a key role in bringing together multiple disciplines as well as patients to produce a common set of standards for digital innovations. The PRSB has been working with other organisations, such as NICE, CQC and NHSI in England, to align its standards with the guidelines and evaluation standards produced by these organisations.
- The **enforceability** of a national set of standards will be crucial in effectively influencing digital transformation across primary care, and GPs should be integral to the development and enforceability of standards against which innovations can be evaluated. The Department of Health and Social Care's *Code of conduct for data-driven health and care technology*[30] is a source of guidance for those developing, deploying and using AI to ensure it is used responsibly and safely. It promotes the development of data-driven technology in accordance with the Nuffield Council on Bioethics' principles for data initiatives.[31] NHSX has developed a Self-Assurance Portal in conjunction with UCL to offer a way for providers to ensure they are complying with these principles and the Code of Conduct.[32]

The NHS National Services Scotland (NSS) and national GP IT Re-Provisioning Project Board has successfully applied an accreditation approach to evaluating and procuring IT systems, contracting EMIS Health, Microtest Ltd and Vision in February 2019 to build accredited systems approved for use in Scotland based on the system meeting specific requirements of Scottish GPs.[33]

In England, NICE published an Evidence Standards Framework for digital health technologies. NHSX has recently been announced as the new lead organisation for digital transformation in the NHS. In light of these changes, it is vital that NHSX, NHS Improvement, NHS Digital and the CQC are joined-up in their approach to enforcing standards on new innovations for the NHS. We welcome the CQC's recent focus on inspecting triage apps for functionality, safety and proof that staff are trained in using them. We would also like to urge the expansion of Medicines and Healthcare products Regulatory Agency's (MHRA) scope beyond medical devices to inspect a broader range of apps and medical software, given the increasingly complex types of healthcare apps entering the market and directly available to patients and GPs.

The CQC in England has also commenced its regulatory 'sandboxing' initiative, supported by the Department of Business, Energy and Industrial Strategy via their Regulator's Pioneer Fund.[34] A regulatory sandbox is a concept that originated in the financial sector as a way of allowing innovative models to come to market and helping the regulator to understand how best to regulate them. CQC's programme which has involved a range of clinicians including GPs, is exploring how this concept can be adapted for the health and social care sectors to provide a more collaborative, proactive and effective way of regulating innovative models of care.

The programme is now in piloting phase with 'digital clinical triaging' as its first sandboxing theme. Further pilots will centre around the use of AI and machine learning in diagnostics; and the emergence of new models of social care that connect people with personal assistants, including through digital platforms. CQC hopes that this initiative will help to encourage innovation in health and social care services and lead to improvements in quality, while ensuring effective regulatory oversight of new approaches that can keep people who use services safe.[35]

Another important regulatory issue which is causing anxiety among the profession is liability and the question of who is to be held liable in cases of misdiagnosis or other patient safety risks where data-driven technology played a role in the patient's care. Clear and practical guidance is needed on division of responsibilities.

1. Ensure there is a common set of evaluation standards in place in each nation which keeps pace with evolving technology and clearly establishes roles and accountabilities for enforceability

Actions:

- The NHS and regulatory bodies such as the MHRA should work with the RCGP and other professional representative bodies to develop a common set of minimum standards for quality, safety, inclusion and clinical effectiveness, and ensure these standards are enforceable for all new innovations developed for general practice.
  - A key step towards achieving a common set of standards is *system alignment*, to ensure clinicians, patients and providers are all facing in the same direction, rather than receiving conflicting messages about what healthcare technology should look like from varying sources. Professional standards and regulatory bodies should work together to align their current and future guidelines and standards.

2. Clearly communicate details about data sharing regulations and patient choices/protections to both patients and clinicians

As outlined above, evaluation and regulatory frameworks must crucially consider data sharing processes and the protection of patient data for various types of patients, for example, those in vulnerable, life-threatening situations such as victims of domestic abuse, modern slavery and trafficking. New digital tools and information systems should provide a safe and secure platform for collecting and analysing patient information, in line with the relevant regulations in each nation. Every patient should also have access to information about their own healthcare to check their information is accurate and help manage their own conditions.

The potential of data-driven technology like AI diagnostics is limited by the current quality of health and social care data which is collected in disjointed and inconsistent ways. The collection and analysis of good quality information is essential for developing new ways of predicting and diagnosing illness using technology. It is also needed to inform an individual's direct care, plan NHS services, improve patient safety and evaluate government and NHS policy.

Developing the public's understanding of these secondary uses is essential to building their trust in the NHS and its use of their personal information for improving health and care overall. *Understanding Patient Data* has produced a variety of case studies and animations which explain why using patient data for these purposes is so important to improving healthcare and how the flow of patient information takes place.[36]

Data protection regulations are complex and evolving, therefore need to be communicated clearly to patients and clinicians, to ensure patients are aware of their rights and choices, and to equip clinicians with the appropriate knowledge so they can safely handle patient data when engaging with digital tools and information systems.

Actions:

- Governments in each nation, the NHS and relevant regulatory bodies and advisors (for example the National Data Guardian) should jointly develop communications and assurances with the RCGP and other professional bodies, to ensure patients understand the benefits of sharing their data for their own healthcare, and clinicians are comfortable using different types of technology that involve recording and sharing patient data in a safe and secure way.

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