



Supporting you on your

digital transformation journey

A warm welcome to Edition 1 2019 of Progress

As always, we bring you news of a whole spectrum of work across NHSScotland and beyond. From improving everyday technologies for staff and patients – such as care for patients at home (page 5) and enhanced IT support for NHSScotland (page 7), to the latest cutting-edge technologies, such as the UK's first quantum learning machine (page 8), new data science capabilities and holographic mixed reality environments (both on page 6) – every progress is about making digitally enabled healthcare possible.

We're also looking forward – not least to our NHSScotland AI Lab Roadshow in May. We're bringing our new London HQ AI Lab to Glasgow, with opportunities for peer-to-peer learning and networking amongst attendees. Called 'Transforming Operational Efficiency through AI', each interactive session will include real examples of how AI has improved operational efficiency whilst enhancing patient experience.

For more details, contact Gareth Lawrence
gareth.lawrence@atos.net.

Meeting to share ideas and experiences remains key to what we do. One recent highlight was November's launch of Atos' thought leadership paper, Journey 2022: Resolving Digital Dilemmas, at the BBC in Glasgow. Attended by some of our NHSScotland customers, this fascinating event included presentations from Atos Scientific Community members on the paper's key themes; you can download a copy of the paper at <https://atos.net/content/mini-sites/journey-2022/>.

I hope you find Progress useful; if there is anything you would like to discuss or see covered, please don't hesitate to get in touch.

Gary Smith
Client Executive, NHSScotland, Atos
gary.smith2@atos.net

New research: accelerating and widening use of digital technology in healthcare

A new report due out in May by the Social Market Foundation, supported by Atos, will explore how technology could be adopted more quickly and widely by the NHS to improve the care that patients receive and to drive better health outcomes. The report seeks to answer the following questions:

- What future steps can be taken through digital technology to improve health outcomes and the patient experience in primary and secondary care?
- Which technologies could help prevent illnesses and promote good health outside of the traditional NHS services?
- How could these improvements manifest themselves across the patient journey or care pathway?

Further, based on the research, it will identify six policy recommendations for driving improvements in the use of technology across the care pathway.

The report tracks the patient journey, from prevention and diagnosis in the community, into primary and secondary care, through into management of long-term conditions. In describing the patient journey, the report charts some evidence of slow and varied take-up

of digital technologies in healthcare. In addition, as well as improving the care experience in primary and secondary care, the report argues that there are huge opportunities to use technology to reduce the burden on the NHS.

The report sets out proposals for future development of technology in the NHS that impact across the patient journey which are based on three core foundations. Firstly, the recommendations form part of a wider contract with the public. Secondly, the report argues that whilst the NHS should make digital healthcare more accessible and more patient-centred, in many areas it supplements rather than replaces existing practices. Thirdly, the report takes as a starting point an emphasis on empowering NHS staff to make use of digital technology to make their jobs easier and enable them to spend more time focusing on patient care.

For further information and to obtain a copy of the report, contact:

Jerry Ashworth
Head of Public Affairs, Atos
jerry.ashworth@atos.net



The future of health and wellbeing in Scotland

Delivering transformational change and embedding new technologies into high-pressure clinical settings is always challenging. It demands new thinking and ways of working together to do things differently, optimising and maintaining core services while delivering transformation through a roadmap of digital innovation. Scotland is blazing a trail with its Digital Health and Care Strategy and action plan for Technology Enabled Care to drive efficiency and improve outcomes.

Giving more power and control to citizens

Wearable devices and smart clothing to monitor vital signs, activity levels and posture are increasingly used by people of all ages (see page 4 for more about new developments in smart fabrics). We're moving to a world in which all citizens will have access to these kinds of self-service tools to manage their own health and wellbeing and make more informed lifestyle choices to reduce demand on traditional services.

Supporting and empowering patients

When citizens become patients, digital technologies can help to manage their conditions and treatment regimes. More and more patients will use video calls and share data online with clinicians and, where appropriate, self-diagnose, triage or refine dosages. Digital channels and tools will help patients more quickly connect to the right service, at a time of their choosing, to progress their healthcare journey. Again, smart devices will monitor any changes so that action can be taken.

Patients will have access to world-class specialists from the comfort of their home, with emergency care data available instantly. Should the patient require any supporting services, these will be available from a variety of providers and automatically provisioned at the time of patient need. If prescriptions are needed, these will be ordered and processed digitally and patients will collect them at a time and place convenient to them.

With huge progress being made in genomic research, personalised medicine will also become a day-to-day reality, with prescriptions and care plans based on individuals' genetics and preferences as well as their condition.

Enabling and supporting staff

Increasingly, staff will have access to powerful analytical and cognitive tools to support timely day-to-day clinical decision-making, with the potential for the following to be implemented:

- Stressful and time-consuming travel could be reduced by holding case conferences and multi-agency meetings online, with video links where needed
- Staff will be able to develop their skills and gain qualifications through virtual reality sessions at home
- The automation of administration processes such as rostering will free up more time for patient care.

Transforming service provision

Digital technologies for storing and analysing data will enable a major shift in the delivery of care. With more and more patient consultations happening remotely, expensive hospital facilities will be used for the most complex cases. The design and location of healthcare services will be informed by sophisticated analytics that draw on population stratification and demographic information. Increasingly, analysis of data will mean that ward and clinic staffing levels will be automatically predictable on an hour-by-hour basis using information on patient conditions and dependency levels, as well as weather and other datasets.

For further information contact:

Ailsa Chandler
Account Director, Atos
ailsa.chandler@atos.net



Global trends in healthcare

The prospects for innovation in healthcare have, perhaps, never been so bright, with new technologies such as immunotherapy and genomics promising to bring revolutionary advances in medicine and life-extending therapies. Yet at the same time, rising demand and changing demographic trends put the sustainability of healthcare systems all over the world at risk. Continuing to accelerate innovation in health while bending the cost curve is therefore a vital challenge for the years to come.

Pioneering the way to precision medicine

As part of Atos' Look Out 2020+ thought leadership series, a new paper, "Pioneering the way to precision medicine", explores the impacts of new technologies on healthcare at a global level. It sets out how Predictive, Preventive, Personalised and Participatory (P4) care is, at last, on the horizon, together with population health management and precision medicine. These advances not only create multiple opportunities, they also mean all stakeholders need to fundamentally rethink the way they interact with patients, conduct their operations, structure their business models and guarantee medical safety.

With complex healthcare stakeholder ecosystems and billions of patients and connected healthcare devices, healthcare will be an increasingly data-intensive field. To address the data challenge, the paper examines the need to build next-generation platforms needed for next-generation healthcare ecosystems - including how to bring legacy technology into the digital era. It also sets out current major challenges and opportunities for the future of healthcare: how to rethink the patient experience, dramatically reduce costs, develop value-based healthcare and guarantee total trust and compliance. The paper includes glimpses of the future of healthcare from experts in digital transformation, plus ten disruptive technologies all plotted on a digital radar that looks set to shape the future of healthcare.

For a copy of the Look Out 2020+ report, **Pioneering the way to precision medicine**, go to <https://atos.net/content/mini-sites/look-out-2020/healthcare/>.



The future of smart fabrics

While the future of smart fabrics is hard to predict precisely, the development of integrated micro-electronics, the research into smart materials, the growth and technical advances in IoT (Internet of Things) and the incredible progress of machine learning, are all paving the way to the fast development of integrated smart fabrics.

A white paper from Atos explores smart fabrics technology and the upcoming developments in this exciting new area. One of the prominent uses of smart fabrics is in healthcare because they offer the most direct access to vital or non-vital parameters of a body. Part of the appeal of smart fabrics is to be able to reduce the amount of visible sensor devices necessary and increase acceptability by patients.

These fabrics' most basic use is to monitor vital data of patients during normal daily activities: heartbeat, ECG, carotid pulse, respiration, breathing pattern, skin temperature, skin impedance and physical activity. This enables individuals to manage their own healthcare needs and promotes preventive healthcare. Smart clothing will also have a key application in remote monitoring of chronically ill patients or those undergoing rehabilitation, especially in telemedical applications.

One example is Wearlumb, developed by Worldline, that assesses the risks of incorrect postures at work. This can help, for example, to prevent lumbar problems and pain suffered by health professionals lifting patients, moving beds and so on. It is based on smart elastic equipped with motion sensors and connected to an expert system that analyses and corrects the user's posture. By implementing precise corrective measures in real time, it reduces by 40-50% the evaluation time/cost by experts, with better-quality results.

For a copy of the white paper, **Smart Fabrics**, go to <https://atos.net/wp-content/uploads/2018/01/atos-smartfabric-white-paper-1.pdf>.

A video about Wearlumb is available at <https://youtube/bV8GVgWbvwC>.

For further information contact:

Heidi Idle

Head of Communications, Big Data & Security,
Scotland, Ireland and Wales, Atos
heidi.idle@atos.net



Drivers of change in healthcare

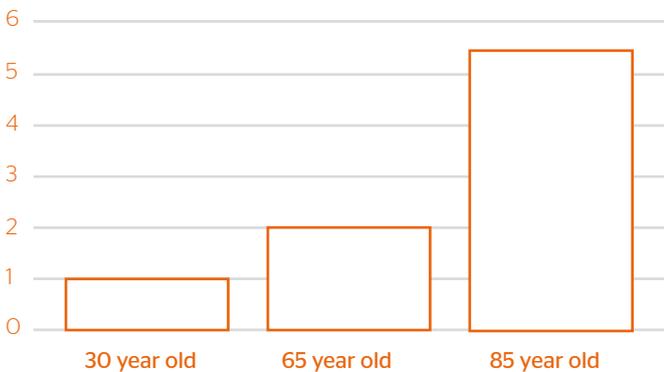
As a nation, we are used to visiting the doctor to get pills and treatments. Yet imagine the next time you visit your GP and you are prescribed an app and ten weeks doing the 5k park run on Saturday mornings.

One thing is clear, digital services are presenting new opportunities for care, but what will drive the change? One key driver will be the affordability of our care system as the population ages. Some key facts:

Comparing NHS spending on people by age

Spending for patients increases as they get older

Relative cost in £



Source: UK health spending, Institute of Fiscal Studies, May 2017

Enabling Home Care

The opportunities for digitally enabled care are significant, both in reducing costs and providing better care. The cost of an acute hospital bed is about £1,500 per day. The cost of running a Home Care system for a year is about the same, and potentially less. Instead of taking up expensive hospital resources, patients could be sent home with a digitally enabled Home Care kit for their medical conditions.

The technical challenges of Home Care, however, are not to be underestimated. For example, in-home sensors typically have a communication range of about 100 feet, which is cut in half by every wall that exists between a sensor and the communication hub that transmits the data to the people monitoring the person in their home. Yet there are solutions to this, for example using technical standards like Zigbee, where each sensor provides data while acting as a relay to other sensors to create a link to the communication hub. A Home Care kit must not rely on a person's own internet connection; we should not have a situation where only people with internet can get the best care.

- The number of pensioners in the UK will almost double between 2000 and 2040, from 10 million to 19 million. Each million pensioners cost the UK £15 billion a year in health and welfare costs
- In 1957 when the UK pension was introduced, there were two pensioners for every ten workers and they were living seven years beyond pension age. By 2040, there will be five pensioners for every ten workers living 25 years beyond pension age.

It is clear that if we keep doing things the way we do today, the UK will run out of money.



User challenges also exist. People using Home Care may not be familiar with technology and the internet. Implementing Home Care needs to be done in a way that keeps people in control of their data as well as their health. Home Care should require minimal involvement, working more like a TV - turn it on and you are good to go.

The final change is to the health system itself: the Government needs to take a 'whole system' view of costs related to health and care, so that spending in one area of Government to save money in another becomes easier.

So, next time you visit a GP, don't be surprised if the answer is an app, not a pill.

For further information contact:

David Dinsdale
Chief Digital Officer - Public Sector & Health, Atos
david.dinsdale@atos.net

Supporting the research community with new data science capabilities

Lead times on clinical research projects are often significantly extended because data sources are disparate. Data may be uncatalogued, accuracy cannot always be guaranteed, and high-power computing is needed to run the required algorithms to process the data. With these challenges in mind, University College London Hospital (UCLH) Charity is funding a UK-leading healthcare data science capability within the UCLH Clinical Research Informatics Unit and in partnership with a number of vanguard organisations.

With Atos, UCLH is designing and implementing the Experimental Medicine Application Platform (eMAP), an agile platform to enable smarter and repeatable research and data analytics. The platform will ingest and store data from a variety of sources, with the ability to retrieve and analyse the data and develop analytics models and algorithms to deliver applications that facilitate improvements in operational efficiency, patient safety and overall healthcare experiences.

Initially the platform is being used to enable UCLH to optimise the forecasting of resources in ITU, a challenge faced by many other trusts. Key benefits include improved occupancy prediction, higher operational efficiency and better patient experiences, with a live integrated view across the Trust.

Development of eMAP will provide the wider research community (clinicians, academics and data scientists) with a more effective, streamlined process for accessing rich operational data.



It will enable them to use their preferred analytics tools, promoting innovation and removing the burden on the hospital estate of deploying and maintaining multiple business information and analytics tools. eMAP will also facilitate the development and refinement of research algorithms on synthetic data in test environments before they are deployed on data in live environments.

For further information contact:

Kirsty MacLeod
Principal Consultant - NHSScotland, Atos
kirsty.macleod@atos.net

A new mixed reality platform for healthcare worldwide

In mixed reality environments, users can navigate through both real and virtual spaces at the same time. In this way, entirely new visualisations become possible, with physical and digital objects able to co-exist and interact in real time thanks to holographic technologies. The HoloCare platform is an innovative way of developing and delivering mixed reality solutions for healthcare. It was launched publicly in March 2019 and is now accessible worldwide. The clinical innovation for HoloCare is from Oslo University Hospital, with Sopra Steria providing the technical expertise.

Using Microsoft's HoloLens capability and Azure scalability, solutions for multiple surgical specialities have been developed, as well as the means to provide remote psychiatric therapy to patients who cannot be moved safely.

This unique partnership serves as a common resource to build and share knowledge for future healthcare solutions using holographic computing.



Ole Jakob Elle, Head of Medical Cybernetics and Imaging at the Intervention Center at Oslo University Hospital, said: "There is a potential here to save lives. We believe that using HoloCare for planning and conducting surgical operations can lead to fewer complications. In addition, this type of approach is likely to lead to more successful surgical outcomes because the surgeons gain a much better insight into the patient's anatomy and condition".

John Berland, Innovation Director at Sopra Steria Scandinavia, said: "This is a success story that shows the potential of collaboration between public and private partners. None of us could create anything like this alone".

If you are interested in working with mixed reality technologies in a clinical setting, we are keen to hear from you to help bring your ideas to life.

To read more about HoloCare, go to <https://holocare.org>.

For further information contact:

Kenny Morton
Client Manager, Sopra Steria
kenny.morton@soprasteria.com

Improving real-time management of NHSScotland IT services

To deliver effective daily support to IT users, the ability to use 'tickets' to log and prioritise user needs and requests is essential. With one of Atos' ticketing tools coming to the end of its life, a decision was made to transfer to ServiceNow as the new ticketing tool for NHSScotland. One reason for choosing the new tool is the real-time information and reporting it provides for IT service managers.

ServiceNow is an interactive and intuitive IT service management solution. It gives Atos a single end-to-end view of IT processes and infrastructure so that services can be managed in real time. ServiceNow provides easy-to-use real-time dashboards for IT service managers in NHSScotland and Atos, with options for them to customise these dashboards according to their job role. This means they can more easily track and measure how quickly and effectively IT requests, changes and incidents are being dealt with.

Other benefits of ServiceNow include automated ticketing for servers, operating systems and networks so that tickets can be allocated, prioritised and resolved more quickly. In turn, the benefit for NHSScotland staff is more effective and efficient support and delivery of everyday IT services.

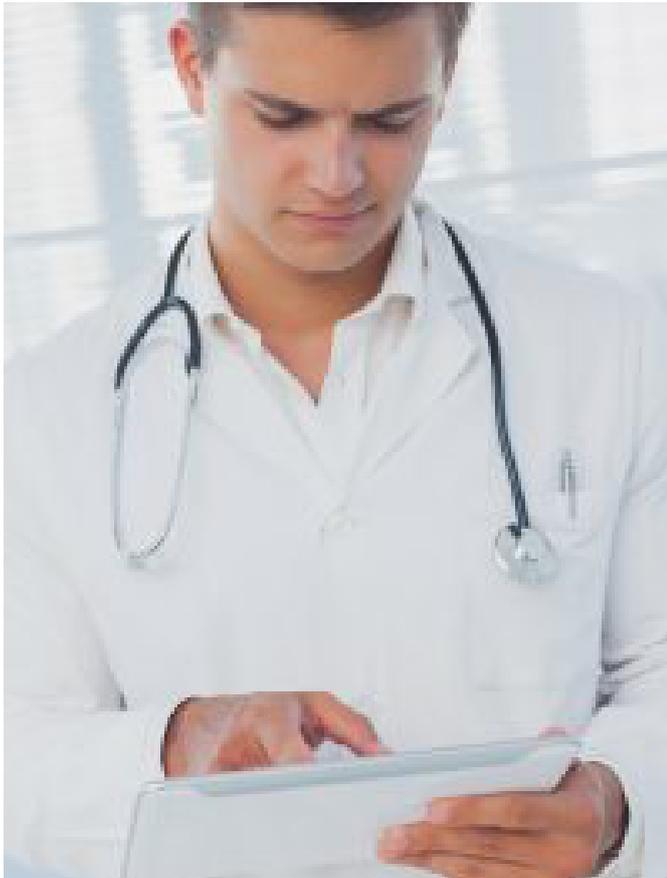


For further information contact:

Bill Watt

Programme Director - NHSScotland, Atos
bill.watt@atos.net

IT for a sustainable future: West Hertfordshire Hospitals NHS Trust



West Hertfordshire Hospitals NHS Trust has appointed Atos to deliver IT services, including a new network, at the Trust over the next three years.

Helen Brown, Deputy CEO, West Hertfordshire Hospitals NHS Trust, said: "Information technology is playing an increasingly large part in patient care. Our new partnership with Atos will drive significant improvements in our current systems, making IT a strategic enabler as we redevelop our sites and transform services for our patients".

As in other trusts, there is wide recognition that the use of technology to reduce the need for direct use of NHS services and ensure that patients get the best possible healthcare experience and outcomes is key to a sustainable future. In leveraging its technology portfolio, Atos will enable the freeing up of clinician time to focus on health, wellbeing and patient outcomes for the Trust, which provides care to around half a million people in West Hertfordshire and surrounding areas.

Nikki Kelly, Atos UK&I Senior Vice President for Public Sector, said: "We look forward to working with West Hertfordshire Hospitals NHS Trust to deliver a high performing IT environment and platform that the Trust can use to renew and enhance patient care and experience".

For further information contact:

Samantha Jones

Head of Health, Atos UK&I
samantha.jones@atos.net

Atos delivers the world's most powerful quantum simulator

Over the next decade, quantum computing will become a reality. It will deliver exponential increases in performance that will transform what is possible using digital technologies for organisations everywhere.

In a major step forward for the UK, a leading high-performance computing research facility, the Science and Technology Facilities Council's Hartree Centre in Cheshire, has taken the first UK delivery of an Atos Quantum Learning Machine, the highest-performing quantum simulator in the world.

The new Quantum Learning Machine will be used to develop new quantum-based services to help researchers and industry prepare for the coming quantum computing revolution.

Commenting on the partnership announcement, **Andy Grant**, Vice President, HPC & Big Data, Atos UK and Ireland said, "We are delighted to deepen our existing relationship with the Hartree Centre, which we believe will help UK industry future-proof itself for the arrival of quantum computing. Our Quantum Learning Machine as a service will be available to any organisation wanting to learn about, and experiment, with quantum computing and understand the key opportunities and challenges this technology presents. Quantum is the future of computing and it is crucial that organisations are ready to harness the coming revolution".

Alison Kennedy, Director of the STFC Hartree Centre, said: "We're thrilled to be enabling UK companies to explore and prepare for the future of quantum computing. This collaboration will build on our growing expertise in this exciting area and result in more resilient technology solutions being developed for industry".



Atos is also working with international life science company, Bayer, and RWTH Aachen University to evaluate the use of quantum computing in research and analysis of human disease patterns using the Quantum Learning Machine and anonymised real-world data of intensive care patients.

To find out more about quantum learning, visit <https://atos.net/en-gb/united-kingdom/accelerating-quantum-revolution>.

For more information contact:

Andy Grant
Vice President, HPC & Big Data, Atos UK&I
andygrant@atos.net

Consumer research to help healthcare organisations improve their cyber security

As organisations continue to digitise and citizens expect, and want, more digital access to healthcare, cyber security is on the critical path for any healthcare organisation. Your patients' attitudes towards cyber security gives insight from research into public perceptions about cyber security in the health sector. With 36% of people saying their medical details are the personal information they value the most, the report discusses a clear change in cyber awareness, where the responsibility for cyber defences lies and how healthcare organisations can build wider trust.

New generations of citizens expect far more personalised interactions and digital engagement; and at the macro level, digital transformation is essential to make healthcare services more efficient and to drive down costs. That means cyber security must be integral both to the digital patient experience and to ongoing digital transformation.

To find out more about cyber security in health, visit: <https://atos.net/en-gb/united-kingdom/digital-vision-programme/currency-of-cyber-trust-research-report/cyber-health>.

For further information contact:

Ailsa Chandler
Account Director - NHSScotland, Atos
ailsa.chandler@atos.net

This insight comes from independent cyber security research programme, The currency of cyber trust, which explores personal risk, responsibilities and shaping the right experience for customers. To find out more, listen to the podcast series or read the full report, visit: atos.net/cyber-research-uk

