## DIGITAL HORIZONS

Spring 2021

## The future of healthcare

### Cutting through the complexity to deliver real impact P7

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Arden and Greater East Midlands Commissioning Support Unit

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## Welcome...

Welcome to the new edition of Digital Horizons - our technology newsletter to keep you informed of the latest digital developments in healthcare.

In this issue we'll be looking at the impact of the COVID-19 pandemic on healthcare delivery and how different care settings have embraced existing technology to minimise potential exposure for both patients and workers.

We take a look at how primary care has adapted its support to care homes aided by remote monitoring and diagnostics. We also hear from our guest contributor, ATWG on how immersive technology has been playing a greater role, particularly when it comes to staff learning and patient education.

Our latest update on the Global Digital Exemplar (GDE) programme evaluation also considers the advantages of digital maturity in being able to respond and implement solutions at pace.

Alongside COVID, one of the key themes running through this issue is the potential offered by 5G connectivity. At Arden & GEM, we believe connectivity is key to digital transformation and in 2021 we will continue to work with 5G test beds and mobile operators to shape new models of connectivity-enabled care.

In addition to the care home diagnostic tools which are helping GPs to remotely monitor and assess patients, you can also hear from the Satellite Applications Catapult about the 5G enabled 'Living Lab' facility as well as an update on how better connectivity can support the move to at-home diagnostic tests.

And lastly, we have an update from the 'Population and Person Insight' project on their work to develop national resources for population segmentation.

As an NHS organisation, we are always keen to share our thinking and understand your ambitions, so whatever your digital healthcare challenges, we'd love to engage in an exploratory discussion with you.



Head of Digital Transformation at NHS Arden & GEM CSU

## Changing how we deliver primary care in care homes

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The consequences of the **COVID-19 pandemic have** demonstrated more than ever the need to protect care home residents from unnecessary risk.

But delivering healthcare has traditionally exposed this population to additional risk whether that is an infection risk from a circulating group of healthcare workers or delirium risk from hospital admissions.

With the Network Contract Direct **Enhanced Service (DES) specification** setting out the expectations for primary care to deliver Enhanced Health in Care Homes, health and care systems are increasingly turning to technological solutions to improve care quality and outcomes for residents while increasing efficiency.

Arden & GEM has been working with two technology suppliers, Tekihealth and Dignio, as part of care home pilots in the North West, Yorkshire and Midlands.

#### **Remote consultation and assessment**

Tekihealth, founded by two practising GPs, has developed a remote assessment solution called Teki-Hub which enables doctors to conduct a full clinical assessment through the use of tele-diagnostic equipment. A handheld modular diagnostic device connects to a compact lightweight wireless internet router, with a video conferencing platform allowing GPs to communicate directly with the patient and care home staff. This is complemented by a portable digital spirometer and ECG monitor.

The diagnostics device - which includes a high definition camera, no-touch infrared basal thermometer, digital stethoscope, otoscope and tongue depressor - arrives fully boxed and can be used by staff with or without medical training to support virtual ward models of care and for triage, assessment and even direct supervision of treatment.

Teki-Hub has currently been implemented in 16 care homes in Staffordshire, Wolverhampton, Dudley, Coventry, Norwich, West Yorkshire and Scotland, with project management and evaluation support provided by Arden & GEM.

For patients, Teki-Hub delivers continuity of care in a safe manner, with technology that goes beyond a simple online consultation by using the highest guality diagnostic device and connectivity solutions. For GPs and Primary Care Networks, Teki-Hub enables regular care home rounds to be conducted virtually which releases clinical capacity while reducing costs and overheads.

#### **Remote patient monitoring**

Dignio provides a remote patient monitoring system, supported by physiological observations, which detects clinical deterioration in health triggering earlier clinical intervention. Earlier intervention delivers better clinical outcomes and fewer, more appropriate hospital admissions.

Following a successful care home trial in Stockport, Dignio was recently commissioned by NHS Dudley CCG to undertake a trial in two local care homes. Following a patient consent and staff training process, digital thermometers and pulse oximeters will be used by care home staff to submit results to a clinical hub, where a Around live patient dashboard will be monitored. Clinical parameters are agreed in 28,000 emergency consultation with GP leads, with amber or red alerts being flagged to an admissions from advanced nurse practitioner who will then contact the home with a view care homes to to clinical triage. hospitals in England are made each vear

The combination of questionnaires and clinical monitoring ensures acute clinical deterioration or changes in chronic conditions are detected with ease.

With nursing and care home populations at continued risk from COVID-19 set against significant pressures within the primary care system, remote monitoring and assessment offers a more efficient model of care which can improve outcomes for a vulnerable group of patients.

To find out more about the two technology solutions featured in this article, email contact.ardengem@nhs.net

**Research by** the Nuffield Trust has shown that providing a dedicated service for care home patients could cut hospital admissions by a third

## Immersive technologies in healthcare - The rise of AR, VR and MR

After several years of slow growth, COVID-19 has fueled the rise of immersive technologies such as Augmented Reality (AR) and Virtual Reality (VR), pushing the technology to the mainstream while paving the path for Mixed Reality (MR). Dr Shamim Mousavi from AWTG explains the growing role that immersive technologies are playing in healthcare.

AR, VR and MR can deliver realistic psychological and physical experiences through immersive real-life simulations in a safe environment. These technologies have brought unlimited possibilities in health, medicine and smart industries enabling a more interactive, engaging and efficient execution of operational tasks.

Today the use AR, MR and VR, or immersive technologies, in healthcare is growing for a variety of tasks including:

 Diagnosing and treating dementia, depression, PTSD, phobias and other physical disorders and pathologies

- Faster and more effective remote diagnostics and surgery
- Training medical personnel
- Exposing patients to information they need to learn faster and more effectively.

#### The basics of immersive technologies

**AR - Augmented Reality** is the result of using technology to superimpose digital elements (such as sounds, images, and text) to the world we see using a tablet, smart eyeglass or a smartphone camera.

**VR - Virtual Reality** is an immersive, three-dimensional, computer-generated environment which can be explored and interacted with by a person. Instead of projecting the images and sounds on a real environment, virtual reality uses a headset to immerse users within a 360-degree environment.

**MR - Mixed Reality** is the merging of real and virtual worlds to produce new environments where both physical and digital objects co-exist and interact in real time such as the use of holograms and mixed reality glasses.

All these immersive technologies come together to give the user a realistic experience of their augmented or virtual surroundings, allowing a better perception of the environment, which is evident by the popular use of these technologies in gaming. However, the same technology can be used to address many of the challenges faced in the education and health sector or even better a combination of both, healthcare education.

# Immersive technologies in healthcare education

One of the greatest advantages of AR, VR and MR is the immersive learning that can be made possible by using a smartphone app, simple cardboard VR glasses and earphones, where interactive 3D objects give the user a real life-like experience of the simulated environment.

Immersive technologies are used to train students and medical practitioners before exposing them to real-life patients through interactive learning. The results are a reduction in learning time and a better grasp of operative technique through more realistic visuals than books and videos. Imme. Another application of immersive learning is patient education. This can be especially beneficial to paediatric and elderly patients that are about to undergo a procedure. The immersive experience with AR, VR or MR will let them

Another benefit is the higher engagement rate which has a direct result on performance and knowledge application. The learning medical practitioner can realistically see themselves in the situation, explore different structures within the region being studied and have a better perception of real-life outcomes. A practical example of this is AWTG's AR/VR tool which aims to train non-radiologists to

### **AWTG** www.awtg.co.uk

AWTG is enabling deployment of AR, MR and VR for smart health with no software development or coding required.

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perform bedside ultrasounds on patients. The use of this technology not only facilitates efficient learning and better grasp of images but also helps deal with challenges faced by healthcare providers to meet demand in less than 6 weeks. The more people trained to perform a procedure, the higher the capacity of providers to meet public demand which, in turn, gives more practitioners the ability to practice different techniques and in a shorter time.

e understand the reason behind the rocedure, how the procedure is performed and what to expect. This can significantly reduce anxiety levels and also increase cooperation during treatment. Patients are willing to follow post-operative instructions better when they understand the reasons behind them and see the effects they have on the healing.

## Cutting through the complexity to deliver real impact

Arden & GEM's Head of Digital Transformation, Adrian Smith shares his thoughts on how the NHS needs to cut through the complexity to focus on clear challenges, and how Arden & GEM have shaped its digital offer to enable this.

Tony Robbins - the respected coach, motivational speaker and philanthropist - declared " complexity is the enemy of execution". Surely nowhere is this truer than in the NHS.

So many growing pressures on the service, so many interconnected health challenges and co-morbidities, so many operational issues and legacy constraints make a very long list. It's a wonder that so many demonstrably great leaps forward in healthcare provision have been achieved.

Sometimes though, and Covid has demonstrated this, it's essential to cut through the complexity and focus on very clear challenges.

In 2014, in outlining the Five Year Forward View (5YFV), Sir Simon Stevens stated that:

"Obesity is the new smoking, and it represents a slow-motion car crash in terms of avoidable illness and rising health care costs."

Get serious about obesity or bankrupt the NHS was the cry. A key part of this of course is diabetes, the consequences of which cost the NHS billions of pounds and adversely impact millions of lives.

Seven years on have we grasped the challenge and cut through the complexity? No. Despite widespread acceptance that digital solutions are needed to tackle the scale of the challenge, the response has not been proportionate to the need.

Many small-scale digital pilots have been funded but none have been adopted at scale. As the NHS Long Term Plan succeeded the 5YFV, around £3 million was set aside to accelerate one digital solution, with limited effectiveness. Kite in a hurricane is the expression that springs to mind.

As Covid continues to exert its grip, it's hard not to assert that had we really got to grips with obesity and diabetes over the past seven years, through digital interventions, we might have eased the pressure on NHS resources, freeing up capacity for Covid, while simultaneously reducing Covid vulnerability for a significant population group.

At Arden & GEM we have strived hard to ensure our digital offer is clear, understandable and impactful.

- of all sizes
- digital technologies.

Of course, both these services might embrace a range of digital technologies - AI, digital therapeutics, VR, remote diagnostics to name a few. But our approach isn't about the individual technologies, it is about the transformation needed to take advantage of those technologies.

In previous issues of this newsletter we have reported on our central role in the Global Digital Exemplar (GDE) programme. Our work here is a prime example of how we can support major digital transformation initiatives. From early benchmarking of current status, to driving shared learning initiatives, blueprinting of exemplar approaches and wide-ranging impact evaluation we have been able to offer a complete service to manage transformation. Digital transformation remains dependent on adoption and ownership so our stakeholder engagement and communication expertise plays a critical role too.

When it comes to shaping new models of care through digital technologies we can work at any level. We can support entire health economies to review where digital fits in achieving critical outcomes and determine the patient and financial impacts of change. Or we can focus in on a key care pathway and use our proven modelling approaches to help determine which technologies can have the biggest impacts to tackle specific pinch points or help broadly improve pathway processes.

Much of what we do here relies on a unique set of partners and relationships - in government departments and agencies, in industry or in the third sector. Sometimes these relationships bring us into deep engagement with very specific pathways and technologies – AI for cancer diagnosis, 5G connectivity for remote patient monitoring or geospatial intelligence for COPD management. When we find these powerful combinations we are always keen to share our ideas and innovations widely.

If you want to hear more about what we do and how we do it, cutting through complexity to deliver real impact - you know where to find us...

Email me at Adrian.smith11@nhs.net

#### Fundamentally we offer just two powerful services:

Managing digital change and transformation programmes

Designing and developing new models of care based on

### How living labs are accelerating the use of medical technology

A new 'Living Lab' facility in Buckinghamshire is helping health economies explore how medical technology (MedTech) can transform care pathways and improve outcomes for patients. John Vesey, Business Manager for Health at the Satellite Applications Catapult tells us more.

The Living Lab concept was born out of an ongoing partnership between the Satellite Applications Catapult and NHS Arden & GEM CSU.

It delivers a facility where health systems can safely create, test and trial technologies, enabling the often difficult transition from proof of concept and pilot to large-scale rollout. Since its launch in May 2020, the Living Lab has focused on support for healthcare economies that are trying to work proactively with connectivity technologies, such as 5G and satellite networks, to solve specific challenges around shifting care from the clinic into the community - critical in a post-COVID environment. But there's scope for a broader exploration of 'the art of the possible'. This requires an approach that starts from a careful consideration of the problem and opportunities, before exploring the potential MedTech solutions that should be trialled in order to drive digital transformation forward.

The Innovation Centre at Westcott, in Buckinghamshire, is fundamental to the Living Lab. What started as a physical space to host demonstrator ambulances showcasing a range of futureproof connectivity solutions - rapidly developed into a flexible workshop and co-creation space, providing simulation facilities to showcase hardware and software options across a broad range of care settings including GP surgeries, care homes and hospitals.

The rural location of the Innovation Centre offers plenty of space for conducting trials and has the benefit of 5G connectivity on site. This has already enabled extensive testing of the capabilities of both emerging and complementary technologies. For example, connecting to a 5G modem when travelling at speed and how we can use drones to support healthcare delivery.

westcott Innovation Centre Part of the early evolution of the Living Lab has been driven by adapting to restrictions forced by the COVID-19 pandemic. In addition to being physical space, the Living Lab now also delivers a range of virtual engagement opportunities for healthcare organisations and systems unable to visit.

The innovation methodology that we have created can be applied physically and remotely, with any care pathway or health economy, to explore how performance and outcomes could be improved by MedTech; specifically, technology enabled by connectivity.

As we embark on 2021, we already have a range of exciting initiatives planned that will push the boundaries of the Living Lab even further. We are building upon the expertise of the Catapult and NHS perspective provided by Arden & GEM by engaging with a range of technology partners to deliver insight into how the next generation of MedTech can meet the challenges of emerging Integrated Care Systems. For example, Amazon Web Solutions (AWS) are co-hosting an event with us in March to explore how cloud and edge computing technologies can introduce sustainable change.

Getting involved with the Living Lab is simple, just email health@sa.catapult.org.uk and we will contact you to understand your challenges and explore how we can support you.



"The GDE programme has enabled us to deliver digital but the key is to have the clinical leadership to gain adoption or you will not see the benefits."

# GDE programme: where has it all led?

Since May 2018, Arden & GEM's digital transformation team has been working alongside experts from the University of Edinburgh to evaluate NHS England's flagship Global Digital Exemplar (GDE) programme.

As described in earlier editions of this newsletter, the evaluation team - which also includes University College London and Harvard Medical School - has been tasked with assessing the impact of the GDE initiative in helping digitally advanced providers to pioneer the integration of digital technologies into patient care.

The evaluation has been split into five work packages, over a three-year period, with Arden & GEM leading on the 'Scoping study of digital maturity, infrastructures and optimisation plans' phase. This will build upon the CSU's previous baseline review by undertaking a 'key lines of enquiry' (KLOE) investigation across all acute and mental health sites - and will also take in acute fast followers - making 40 sites in total.

WP1: Scoping study of digital maturity, infrastructures and optimisation plans

and their execution

WP3: Study of networking and relationships

GDE programme in an ternational context and develop a strategy for

WP5: Strategic implications of our findings for achieving the GDE programme vision

The approach this year has had to be adapted due to the pandemic, with interviews being conducted over Microsoft Teams. The pressures on GDE sites, due to the combination of winter and COVID-19, has understandably made the interviews with strategic and clinical leads challenging to coordinate, however, they have delivered really rich views on the GDE programme, in what is for many is their final year on the programme.

#### The key lines of enguiry this year were split in to three domains to:

- 1. gain an overview of the GDE experience, sustainability and transferability for gains delivered through the programme
- 2. capture the impact of COVID-19 on the programme and explore if being a digitally mature organisation has helped in the pandemic response
- 3. understand the relationships and wider learning, and what part this has played in the GDE journey.

In addition, sites used an external assessment through the international recognised HIMSS EMRAM model which is a strategic roadmap for effective EMR adoption and maturity.

The HIMSS Analytics Electronic Medical Record Adoption Model (EMRAM) incorporates methodology and algorithms to automatically score hospitals around the world relative to their Electronic Medical Records (EMR) capabilities. The aim for Acute GDEs is to achieve level 7, with Mental Health trusts and all fast followers aiming for a level 5.

Through our KLOE we have discussed with teams what this has involved and whether they have achieved their objective.

The interview information is currently being analysed as part of a comprehensive report to be shared with NHS England and NHS Improvement, the GDE sites and wider forums.

The main headlines that have been captured in interviews so far are:

- The programme enabled additional much needed funding and the development of the infrastructure to accelerate existing digital strategies
- This has funded innovations that may have been on a 'wish list' rather than just on the 'must do' list
- It promotes a collaborative approach which has helped NHS sites to be more open and share more widely than they have historically
- Geographical boundaries no longer limit conversations as the GDE community breaks those down to support links nationally
- New digital roles have been created that are now recognised as critical to supporting working practices and the strategic direction moving forward
- COVID-19 presented significant challenges, however, the GDEs have described that due to the journey they have been on over the last few years and their continued digital maturity, they were able to respond at pace and implement solutions to support clinical needs in hours, days or weeks
- As the digital solutions adopted by the GDEs are with a limited number of suppliers they have found that relationships have matured and are now on a much more equal footing
- Achievement of the required HIMSS EMRAM Level appears to be a mix of reaching levels 5 and 6, with only one site achieving level 7 due to the significant investment and complexities required.

Overall, the reflection of the GDE sites has been that the GDE programme has been a tough journey but a positive one. One team described that this is a continuous accelerated journey that has changed the organisational view of digital with a move to have digital "square and centre" at all levels. For clinical and non-clinical staff, it features at "the centre of everything we do".

"The GDE programme has raised the expectations of the clinicians who now have the ambition and drive to want more and more.

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### National segmentation resources to support health and care systems

National segmentation resources, produced by the Population and Person Insight project, are helping to build the foundations for wider population health and person-centred analytics.

The Population and Person Insight (PaPI) project - a collaboration between NHS England and NHS Improvement's Data, Analysis and Intelligence Service, NHS Arden & GEM CSU and Outcomes Based Healthcare - aims to support commissioners and providers in developing new models of care by accelerating the use of population segmentation. The project will produce a series of person-centric resources in the following areas: data, information, analysis and decision-support.

The first resource developed by PaPI is a national segmentation dataset, available to NHS England and NHS Improvement analyst teams, to enable a better understanding of population health needs and trends to support forecasting and planning.

The person-level dataset uses national data sources to categorise the population according to health needs. Four years' worth of data is translated into segments and subsegments, based on the Bridges to Health population segmentation model, with condition registers for each of the 51 subsegments. The segmentation dataset is available in the National Commissioning Data Repository (NCDR) data warehouse.

It has already been used to the support the COVID-19 pandemic response including calculating estimates of magnitude for risk factors and comorbidities, identification of vulnerable cohorts and understanding excess mortality within segments.

The second resource in development is a national segmentation report. The 'Population and Person Insight Dashboard' is an interactive tool containing a series of views so that users can easily explore and interrogate segments at a national, regional, system, CCG and PCN level.

The report is currently available as a 'proof of concept' dashboard, with feedback on functionality and design currently being incorporated into a second iteration which will be released on the NHS ViewPoint portal later this month.

You can find out more about the project and the resources developed so far on a dedicated <u>Future NHS workspace</u>.

# Delivering powerful remote diagnostics

Arden & GEM has now been actively promoting Colon Capsule Endoscopy (CCE) for more than four years and is delighted that this exciting diagnostic approach is starting to become mainstream in the UK.

There are further exciting developments ahead in which we are playing a key role, helping to eradicate bowel cancer and other gastrointestinal diseases.

We have reported previously in Digital Horizons that NHS Scotland has been at the forefront of CCE adoption - fuelled by the desire to support remote, rural communities, particularly in the Highlands and Islands, and have delivered a managed, community-based service. This service - ScotCap - is now rolled out across the whole of Scotland.

In England there had been less enthusiasm to introduce CCE until COVID added a new dimension. Traditional endoscopy clinics suddenly required extra disinfection and as a result their capacity dropped leading to increased patient backlogs. Out of this has come a 10,000 capsule national trial and we have provided support and advice to teams involved in the trial, building on the ScotCap experience. We sincerely hope this trial will lead to large-scale adoption of CCE in England.



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At the innovative edge of CCE, we have worked as part of a consortium to develop the AI that enables rapid analysis and triage based on the 400,000+ images captured by the capsule cameras. This project is just drawing to a conclusion and the results are even better than we could have hoped -identifying polyps, bleeding and cancers faster and much more accurately than human operators. The AI will enable CCE to be scaled much more readily.

We have also started to work on a new, exciting initiative with West Midlands 5G, the Government's flagship 5G initiative. This project is looking to deliver CCE in the comfort of the patient's own home. Devices and preparatory materials are delivered to the patient's home and then virtual reality and augmented reality solutions, underpinned by 5G connectivity, are used to help the patient safely carry out the procedure without ever needing to visit a clinic. Together with AI, this approach is a route to delivering powerful diagnostics remotely, increasingly important in a post-COVID world.



For details about our full range of services, please contact us:

website: www.ardengemcsu.nhs.uk twitter: @ardengem email: contact.ardengem@nhs.net

