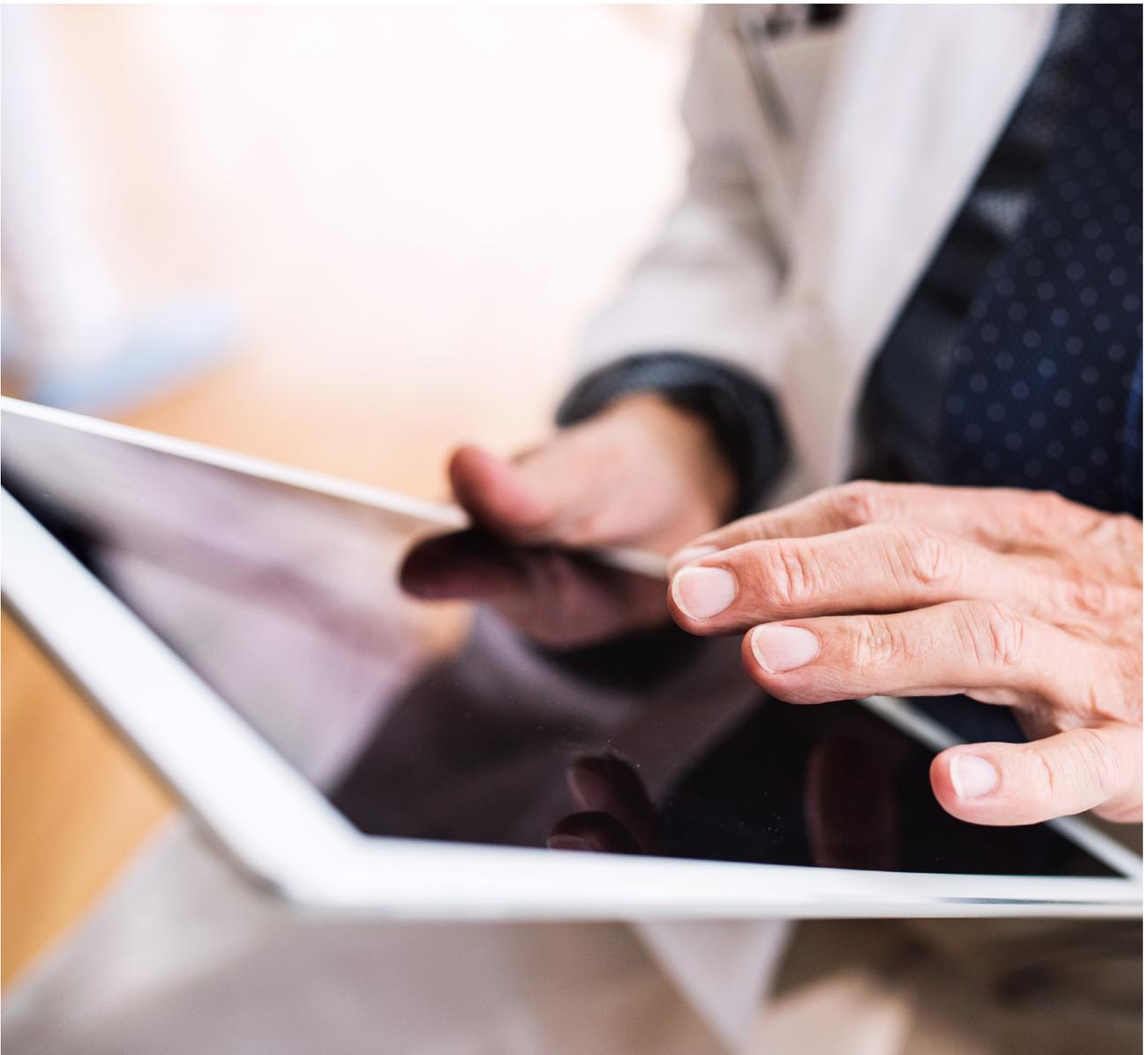


How technology can help alleviate the COVID-19 crisis in the United Kingdom



Orion Health Whitepaper
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A global pandemic on health systems

The current coronavirus global pandemic is having a major impact on health systems around the world and here in the UK. Based on what we have seen happening locally as well as in countries such as China, Italy and Spain, our health systems must continue to prepare for the impact of a massively increased patient load, particularly impacting hospitals. Demand for key items such as intensive care unit (ICU) beds, respirators, ventilators, and personal protective equipment is in danger of greatly exceeding available supply. The clinical and research communities are working around the clock to better understand the disease and its biology to develop and refine clinical interventions needed to meet this rapidly evolving threat.

This white paper outlines some of the key technology and clinical system approaches that health systems could consider in helping to combat the pandemic and manage an unprecedented threat to sustainability and loss of life.

Reducing hospital patient load with Remote Patient Monitoring

Once a person is suspected of having COVID-19, either through testing positive or by virtue of having the characteristic symptoms such as cough, fever, shortness of breath and perhaps a positive CT scan, it is important that they are identifiable by clinicians who can take appropriate action. By providing a dedicated collaborative worklist of patients with specific COVID-19 characteristics, for instance, clinicians and care givers can collaborate work from one central list to manage their patients' care. Patients can be assigned to individual clinicians for appropriate action and enrolled in a COVID-19 care pathway to standardise their care according to best practice. This offers an efficient, automated and integrated solution to tasks that might otherwise take place on spread sheets for instance.

Next, we turn to the most critical aspect of the entire process - managing and reducing the total patient load on hospitals. By safely managing non-critical patients at home, hospital resources can be freed up to focus on the cohort of patients with the most need. To do this, a key enabling technology is a Remote Patient Monitoring (RPM) solution.

For remote monitoring to be successful, the technology must offer a clear trigger points

to automatically escalate patients for clinical review, management or even transfer to hospital. Alerts can be sent to healthcare providers when their patients deteriorate at home. Such assessments can be based on both patient reported symptoms such as their cough, fever and shortness of breath, and by automatically transferring data from devices in particular temperature, pulse oximetry, heart rate and more depending on the devices available to the patient.

Providing COVID-19 test results electronically

Ensuring that citizens receive their COVID-19 test results presents a massive resource challenge to already stretched clinical staff. In particular, communicating negative test results is an ideal example of something that can be done electronically and does not need to take up skilled clinician time and put pressure on phone lines. Communicating negative results via a patient portal is a proven approach to this. As well as surfacing test results, the portal can share tailored educational information to help citizens manage their recovery. Depending on national and regional protocols, some organisations will choose to communicate all test results via a patient portal whilst others may opt to only deliver negative results digitally.

Reducing the burden on clinicians with population-level dashboards and collaborative worklists

Many healthcare providers are seeking to monitor their patient population, identified by their level of risk. This is where population-level dashboards are especially valuable. Dashboards should populate dedicated worklists that enable healthcare providers and managers to allocate patients appropriately to the right staff across the healthcare environment. Collaborative worklists can be made available to healthcare providers both in the community and in the hospital, as well as to care coordinators and support functions facilitating multi-disciplinary team-based care.

Understanding the current and future patient load impacting health systems

High-quality analytics based on population level data contained in an Integrated Digital Care Record (IDCR) are key to understanding current and predicted workloads on healthcare providers and hospitals. Analytics can provide critical information on the number of patients requiring hospital admission, ICU beds, and ventilators. This is crucial in avoiding deaths due to overwhelming numbers of ICU admissions. Over time and as data becomes available, we want to be able to track recovery of patients and use these data sets to inform future algorithms via machine learning.

Integrating care with coordination tools

Today, there is still much that we do not know about COVID-19. For instance, there is a possibility that ACE inhibitors and angiotensin receptor blockers (ARB) may increase patients' risk for severe outcomes.

At the same time, ACE and ARB medications are important medications

in the management of hypertension, cardiovascular disease and a number of other medical problems. Current best practice advice is that patients should not stop their medication without proper assessment and balance of risks and benefits. This will be an easier decision for clinicians to make when we have the data to know for sure whether ACE and ARB medications do in fact contribute to poor outcomes.

Integration with other clinical data, such as information in an Integrated Digital Care Record (IDCR) or Health Information Exchange (HIE), is highly valuable for managing patients given the importance of comorbidities. Individual case management tools are also important, especially for complex patients where COVID-19 is just one of their multiple medical and social problems. Case management and care coordination tools based on the IDCR will add significant value in helping such patients by allowing clinicians to see a more complete view of the patient record.

The challenge in developing technology during an emerging pandemic

The biggest challenge when developing technology during a pandemic crisis, is the rapid emergence of new requirements as the disease progresses and impacts an exponentially increasing number of patients. There is also a lack of highly reliable best practices and scientifically validated, clinically useful information about the disease that can be used to impact decision making. The need to adjust to rapidly changing processes means that the software must be highly adaptable, easy to configure and change. The speed and ease of implementation of the software throughout the course of the pandemic is key to the success of a good population health outcome.

Conclusion

A multi-pronged technology approach during a pandemic

Technology can significantly reduce the impact to health systems from the current COVID-19 pandemic. Technology such as I've outlined here can help healthcare providers with the enormous challenge of managing unprecedented patient volumes amidst an outbreak and make significant progress towards ensuring health systems are not overloaded.

With technology, healthcare providers can both facilitate the care of individual patients in the community and manage according to whole population-level measures. Both are fundamental to understanding the state of healthcare needs and available resources. Over time, machine learning applied to the whole population will give further insights to enable improved responses to any future outbreaks.

Solutions such as remote patient monitoring, collaborative worklists, patient portals, population-level dashboards and integration with care coordination tools can, and already are significantly alleviating the burden on health systems during this rapidly evolving crisis.

Case studies

Technology projects are already a reality and making an impact on the sustainability of health systems during the pandemic.

The Regional Support Group for eHealth Development (GRADeS) in Ile-de-France, the GCS Sesan (Digital Health Service) has enriched its Terr-eSante platform with a module dedicated to COVID-19. Called e-Covid, it enables remote monitoring of patients affected by the pandemic while confined to their homes using Orion Health technology. Patients provide updates across a range of criteria several times per day, in accordance with current approved evidence-based recommendations, under the recommendations of regional experts in infectious diseases. This enables healthcare professionals to follow the progress of their patients in real time and intervene when needed.

In Canada, one province is using the Engage Patient Portal platform to communicate negative COVID-19 results to citizens and provide useful supporting information, eliminating the need for phone calls and saving staff resource. In the first hour of use 300 citizens logged on to the portal to check their results, removing that number of phone calls from the Public Health team's queue.

