

DOCCLA VIRTUAL WARD

SOFTWARE SERVICE DESCRIPTION

Overview

Doccla provides virtual ward and remote monitoring services across the acuity pyramid, delivered as cloud-hosted software with best-in-class managed service support options.

Our solution is an established platform that has benefited from continuous development since 2015. It has been used to monitor more than 4,000,000 patient days with and across 500 clinical pathways. All our NHS clients benefit from our end-to-end service which includes all software, wearable devices, mobile/tablet, managed drive logistics and CQC registered clinical support.

We are able to deploy rapidly at scale. Since our inception in 2019, we have expanded our virtual ward operations to over 40 NHS organisations and have amassed extensive experience in taking referrals from a variety of care settings, including ICB wide contracts, acute hospitals (early discharge/step-down), community settings (long-term chronic and admission avoidance/step-up) and primary care networks (proactive identification of high-risk patients).

Our services have been validated by an independent, NHSx funded study by the Kent Surrey and Sussex AHSN, which has confirmed that Doccla's virtual wards and remote patient monitoring provide substantial, quantifiable operational benefits to our clients. The study, available on the Future NHS website, evidences numerous benefits to virtual care, including enhanced clinical capacity, reductions in average length of stay, and significant cost savings through lower bed occupancy levels. For instance, every £1.00 invested in the Doccla virtual ward, as opposed to a traditional ward, yields an additional return of £3.10. The service is also very highly regarded by clinicians and patients for its efficacy, intuitive design, prompt responsiveness from Doccla staff, and expansion of patient choice through provision of home-based care.

The benefits reported by our clients within the BLMK ICB include:

Overall Patient Outcomes:

- A 29% reduction in Emergency Admissions
- A 20% reduction in A&E attendances

Pulmonary Rehab Patient Outcomes:

- Patients are 3x less likely to get admitted
- A 50% reduction in A&E attendances

Respiratory LTC Patient Outcomes:

- An 11% reduction in Emergency Admissions
- Patients are 3x less likely to have an A&E attendance

Heart Failure Patient Outcomes:

- 1.5x greater likelihood of picking up early interventions through remote monitoring
- Increased GP contact in instances where early signs of deterioration have been spotted

We have also created a number of internal case studies pulled from real world data from our reporting suite and our cost saving calculator. Using data captured from 2023 we demonstrated the following savings:

Respiratory Pathways 2023

- £1,863 costs saved per patient
- 3,705 primary care interactions avoided
- 10,500 clinical hours saved

Cardiology Pathways 2023

- £2,725 costs saved per patient
- 2,603 primary care interactions avoided
- 6,900 clinical hours saved

Our case studies corroborate the substantial operational and cost saving benefits we yield across a plethora of pathways, and we are committed to continuously refining our process to further enhance these operational efficiencies for our NHS clients and patients.

Continuum of Care

The service supports patients across the continuum of care, from supporting self-management behaviours to mitigating risk of admission as well as providing alternatives to discharge and early admission. We provide long- and short-term remote monitoring, adapted to the acuity of the patient. We support remote monitoring via:

- inputting of patient vital sign and subjective response data
- establishing vital sign thresholds in line with NEWS2 parameters
- signposting educational resources
- delivering digital coaching modules
- video and message functionality
- recording PROMS
- supporting PIFU.
- synchronising data into time-ordered graphs for clinical review

The software has been designed to be entirely adaptable and developed on a 'low-code', condition-agnostic basis so that it can be flexed to meet local requirements and tailored to innumerable pathways, providing a truly agile, flexible monitoring solution.

End-to-End Managed Service

The quality of support we provide is unrivalled. We can take care of every aspect of implementation and support, including the onboarding and support of patients, and all logistics to distribute, replace, collect and decontaminate devices. Unlike some suppliers, we are 'device agnostic', so you are free to mix-and-match the best capabilities from a strategically curated suite of devices to meet your business needs.. In line with our commitment to the financial and environmental sustainability of our services, we fully support "Build Your Own Device" approaches to ensure utilisation of existing system assets and continuity of best practice methodology.

Importantly, we are CQC registered, with our own in-house team of clinicians who are specifically trained in remote patient monitoring. This means we are able to provide clinical monitoring support services to alleviate your staffing pressures. This is an asset in certain business continuity and disaster recovery scenarios, for example, should your clinical monitoring teams experience internet outage or to cover short-notice staffing shortages. This will also support your clinicians in resource optimisation by task-shifting patients across to the Doccla team, allowing your team to prioritise caring for the most critically ill in hospital.

Moreover, another distinguishing feature of Doccla's service is our unique provision of compliance monitoring. Missing vital data is flagged on our system, thus prompting a member of our customer service team to contact the patient and remind them to input their measurements to prevent disruptions to clinical monitoring. By leveraging our compliance monitoring services, we have continuously achieved market-leading rates of patient compliance (>95%) and satisfaction (>95%) as patients feel thoroughly looked after and accounted for.

Software and Pathway Functionality

The virtual ward is provided as a cloud-hosted dashboard which can be accessed by care staff via any suitable browser.

All data inputted into the patient app will automatically synchronise with the clinical dashboard, ensuring that clinical data is available for remote monitoring clinicians in near real time. This data is aggregated and visualised into time-ordered graphs, allowing clinicians to track the evolution of a patient's health trajectory and review any breaches of clinical thresholds in the context of historically submitted data. By visualising this data over time, our software gives clinicians, patients and carers intuitive insight into trends and potential triggers, thus informing and driving self-management behaviours.

We also have a carer app that enables professional carers to have a single login, allowing them to view multiple patient profiles and input measurements into their respective questionnaires. By supporting remote monitoring both within care home environments and for frail or disabled patients who require additional support from next-of-kin, our solution provides a truly inclusive care model.

To ensure our services are inclusive towards patients from minority communities, we are continually expanding the library of languages in which our patient app has been translated. Currently, our app is available in English, Italian, French, German, Polish, Gujarati, and Bengali. These languages reflect the most common languages spoken among the patient cohorts treated by our NHS partners.

Patients submit information about their condition, which is then available to their care team. The information to be submitted, and the schedule of submissions, can be straightforwardly tailored, either to groups of patients on common pathways or even to individual patients. The information can either be entered manually into the app by the patient (or by a carer on their behalf) or transmitted automatically from intelligent monitoring devices connected to the app via Bluetooth. This is particularly useful for patients who report low levels of digital literacy

or struggle with dexterity. Vital sign data can be taken both intermittently and passively, depending on the patient's needs. For passively monitoring, vital signs data is continually generated by wearable devices.

The specifics of which vital sign data points will be collated will be informed by the patient's pathway. Our solution is particularly agile and adaptable in that our software allows 'no-code' customisation of the patient interface to include branching logic and complete control of what is presented to the patient, including what vital sign data they will be requested to submit. This flexibility is further enhanced by the versatility of our platform, which is able to support an extremely wide set of vital signs beyond those that are just relevant to a NEWS2 score. These include, for example:

- Activity tracking
- Blood in urine
- Blood pressure
- Blood sugar
- Body-cell-Mass
- Consciousness
- CRP (C-reactive protein)
- CTG
- ECG
- Fat mass
- Fluid intake. To this end, we have specialist scales that support measuring water retention.
- Glucose in urine
- Haemoglobin
- Height
- Leukocytes in urine
- Nitrite in urine
- Oxygen flow
- Pain scale
- Peak expiratory flow
- Phase angle
- Protein in urine
- Sit-to-stand
- Spirometry (FEV1)

You can also define your own quantitative measures to assess a patient's condition. For example, you can ask patients to rate the severity of a cough on a scale from one to five. In this way, our platform provides the widest possible scope for flexible innovation in the remote care and treatment of patients.

To ensure care allocation is effectively distributed and that cases are appropriately escalated, our system has an intelligent alerts system, and patient data will be categorised according to a traffic-light categorisation, prioritising cases which need most urgent attention via Red and Amber alerts. The alerts are not based solely on simple thresholds; instead they can be driven by combinations of factors that together have increased clinical significance. Our system is therefore able to comprehensively assess a patient's condition by tabulating information from a range of data points, ensuring that even the most subtle signs of deterioration are promptly identified and flagged. We also have specific NEWS2 alerts which are generated in accordance with RCP guidelines and visualised within a dedicated NEWS2 dashboard. Importantly, we can tailor thresholds on a patient or cohort basis so that they are appropriately adjusted for each patient profile and context.

In addition to regularly reviewing vital sign data, we empower patients to cultivate self-management behaviours by providing a personalised library of informational resources on their condition. This library is fully flexible and can be altered and curated by clinicians depending on the patient profile. The solution allows clinicians to store images, hyperlinks to information sources, and to categorise these resources by theme or by one or more patient groups, allowing very granular customisation across a range of cohorts and pathways.

Patients and carers can communicate 'in app', or by SMS, voice or video conferencing. The standard text message facility allows messages to be sent to individual patients or to patient cohorts. You are able to establish and maintain a library of message templates, and select which template to use through a simple point and click interface. The names and membership of the messaging groups can all be freely defined.

The platform allows the hosting of content for patients and carers. Our solution provides a flexible library that allows you to curate content and deploy it to your users and patients. The solution allows you to store hyperlinks to information sources, and to categorise them by theme and by one or more patient groups. Patients in a given group are automatically provided with the links to the information sources pertinent to them. There is no material limit on the number of information sources. Links can be straightforwardly added, edited or deleted by users to whom you have granted the privilege to do so. By providing this additional repository of educational content, we ensure patients are empowered to thoroughly self-manage their conditions. Clinicians also have the added benefit of leveraging the remote platform to strategically and efficiently provide in-depth advice to large cohorts of patients so they continue to feel adequately supported.

The software includes a patient referral module that is linked to the Patient Demographic Service on the NHS Spine to ensure that the most up-to-date details for the patient can be input automatically, minimising effort and the scope for data quality problems.

Our software, then, provides a truly flexible solution allowing monitoring across a myriad of pathways, while ensuring there is consistent dialogue between clinicians and patients and that patients remain well-informed throughout their virtual care journey on how to navigate their specific health challenges.

Health Coaches

Unlike many other providers, we are capable of providing enhanced support to our patients through health coaching. For instance, we launched a Living Well with COPD Hub at NHS Bristol, North Somerset and South Gloucestershire. Identifying that admission avoidance would be best achieved by encouraging patients to develop healthy lifestyles to support preventative care, we recruited health coaches to provide 3-6 personalised consultations on how best to make realistic yet tangible lifestyle changes that would enhance wellbeing and mitigate symptoms of deterioration, supporting long term, preventative and proactive care.

We can work with our NHS partners to devise equally innovative and effective models of care, replicating the enhanced and dedicated support and coaching so that patients are provided multidimensional, hybrid modes of care to optimise long term recovery.

Hosting

The virtual ward software is cloud-hosted (in the UK) and may be accessed by care staff over the internet via any suitable browser. Patients link to the ward through a dedicated app on a mobile device.

We provide our software as a cloud-hosted platform with full data management. The patient data is stored on an NHS-approved cloud with automatic back-up and replication across multiple sites. We implement automated back-up that guarantees rapid restoration in the event of significant failures. The back-up strategy includes multiple daily differential back-ups and incremental back-ups, so that in the event of a major system loss, data can be rapidly retrieved to point-in-time recovery.

We adopt a multi-layered defence-in-depth approach to information security, and our presence in and adoption of the cloud helps facilitate this through advanced security controls, 'zero trust' security architectures, network containment and isolation, and adoption of standard reference patterns for information and technology architecture. The technical aspects of the service are monitored automatically around the clock, triggering automated alerts in the event of any data breaches or unexpected incidents. We have many years of experience of deploying the solution as a cloud-hosted service, and we have automated procedures for back-ups, restarts etc. This gives us the ability to completely recreate a fresh instance of the service, in the event of a catastrophe, without loss of data in four hours or less. Our average availability over our several years of operation has been 99.95%.

We take responsibility for every aspect of the technical management and maintenance of the cloud-hosted service, which includes all recommended updates, patches, configuration changes, capacity planning and so on. We implement all client-facing changes in accordance with the client's preferred change management process.

We implement incremental back-ups on a minute by minute basis, which minimises the scope for data loss and the chance that patients will have to resend readings.

We have completed a full scale test of our back-up and recovery arrangements, in which we performed a full restoration and back-up of our entire database and platform. The end-to-end recovery process was successfully completed in under two hours. This gives you extra confidence that we will keep disruption to an absolute minimum in the event of any major system incident. We will also ensure all security and software updates are scheduled outside service hours (which are 8am-9pm) such that the process of upgrading the system will have a negligible impact on service provision.

Our configuration secures the backups by encrypting your data in transit and at rest. Consolidated backup activity logs make it easier to perform compliance audits. The backup is ISO 9001 and ISO 27001 compliant.

We retain all patient data in accordance with the client's written instructions and retention policy. This policy will be collaboratively agreed upon in our Data Protection Impact Assessment as part of our Information Governance Protocols. We will also work together to establish Standard Operating Procedures in relation to how we handle and process data. Where we are asked to erase data, we will ensure that it is permanently erased in accordance with best industry practice.

The licence covers the provision of three environments, namely:

- The live environment for the operational monitoring of patients.
- A training environment, which is kept at the same software level as the live environment, and is intended primarily to demonstrate the functionality of the system for training purposes and to allow the staff being trained to use the solution with dummy data.
- A test environment, in which new versions or settings of software may be deployed for testing purposes. We would expect you to use the test environment for user acceptance testing and, for

example, for the testing of newly developed interfaces.

Information governance and security

We ensure we meet GDPR requirements and obligations through stringent data protection agreements, comprehensive security measures, and robust compliance processes. We have established strong Data Processing Agreements (DPA) with all clients to manage responsibilities around data processing. The agreement ensures the protection of data subjects' rights, including the right to access, rectify, and request the deletion of their data.

We also outline measures for protecting data, including encryption, secure data storage, and detailed protocols for dealing with data breaches. We also provide multi-factor authentication to prevent illegitimate access to patient data and to ensure all logins are authorised members of staff. We can adapt our DPAs to include additional protocols based on the requests of our clients.

The platform is regularly subjected to independent cyber vulnerability and CREST accredited penetration testing, performed by independent security specialists in accordance with relevant guidance from CESG and NHS England. Our products are tested against OWASP vulnerabilities including SQL injection attacks and so on, ensuring maximum security and reliability.

We have automated processes in place that ensure that any recommended security patches for newly discovered vulnerabilities are applied on a daily basis. We also subscribe to newsgroups and other feeds for the key third-party software components to ensure that we are alerted to new vulnerabilities and will apply patches manually during the day if required. If our service is affected by a new security vulnerability, we follow a formal process documented as part of our ISO13485 implementation. If the incident were to have a potential impact on patient safety, the process would include a clinical safety review and, if appropriate, an adverse incident report.

Actual or suspected security incidents are reported by default to the Chief Executive, the Data Protection Officer and the Chief Medical Officer and treated as Priority 1. Where there is a potential impact on customers and users, we will notify them without delay.

Ordinarily we provide remote patient monitoring services in the capacity of a data processor, acting on behalf of an NHS entity who is the data controller. In those circumstances, the data controller is responsible for determining whether it is necessary to obtain and maintain patient consent.

Furthermore, the advice we have sought and received from NHS England is that consent is not necessarily the appropriate basis for processing personal data in connection with the delivery of healthcare.

That said, when we are asked to obtain the consent on behalf of the data controller, we record the date and time upon which consent was given as an attribute against the patient record, which is collected automatically via the app the patient uses to communicate with our platform. We can also record the consent provided by the patient during a telephone call if required.

When we obtain consent, we do so entirely in accordance with UK law and with the guidance published by the

Information Commissioner's Office. We ensure that the person given consent has access to an easy-to-understand description which covers:

- The data we are processing
- The reason for processing the data (including the lawful basis under GDPR)
- How we process the data
- The subject's rights (eg to access data or ensure it is deleted) and how to invoke them
- How we safeguard the data

We do not process personal data except as explicitly instructed by our clients acting as data controllers. We put in place written data processing agreements with our clients in accordance with UK legislation and best practice guidance.

We review the currency of patient consents in accordance with the defined arrangements in the applicable data processing agreement. We will re-obtain consent if and when there is any change to the data processing arrangements, the process being automated and logged.

We conduct regular internal audits to ensure that no data is processed without consent being obtained where required.

Our staff all have training and updates in data security and protection.

Where we subcontract any elements of data processing, we ensure that all of the necessary data protection obligations are flowed down in contracts and data processing agreements with our suppliers.

We are compliant with all key NHSE standards, including: ISO 27001:2022, Cyber Security Essentials and Cyber Security Essentials Plus.

Integration

The virtual ward supports multiple configurable middleware options which conform with NHS digital standards and allow integration with local NHS systems. Interoperability can be two way, with information pulled or pushed via a comprehensive suite of REST APIs which allows access to virtually every aspect of the data and functionality within the platform. This includes, for example:

- The authentication of users and third party clients/services.
- Reading and inputting information about clinicians, patients, messages, questionnaires, vital signs.
- The setting of thresholds for alerts.
- Sending notifications.
- Providing information and guidance.
- SMS messaging and videoconferencing.
- Calendar entries
- ECG graphs and spirometry reference values.

Through this architecture we generate and receive messages in HL7 FHIR and can convert to proprietary formats for integrating systems that do not fully support open standards.

The middleware allows us to share any patient related data attributes as well as larger objects (such as ECG readings for example).

The middleware has sophisticated facilities to manage interconnects. For example, we have a powerful queue management function that will throttle the delivery of messages, if required, to ensure that they are not overloaded by inbound messages from us. The system will monitor the success or failure of transmissions, and will automatically retry (at configurable intervals), generating alerts automatically when a given number of retries has still not resulted in successful transmission. The middleware also performs automatic reconciliations to check that the number of messages processed matches the number of data items that are due to be transmitted.

We can provide fast track implementation of interoperability if required, in which we provide you with a list of preconfigured standard message types which you can implement 'out of the box', following which you can gradually tailor them to meet your local requirements. The contents of the messages are coded according to the SNOMED standards- we provide you with our default codings so you can decide whether to change them before the links are implemented.

We have a standard process for establishing your interoperability requirements which we will outline in our Standard Operating Procedures (SOP) documents, to be agreed upon and refined in discussion with our clients. In summary, we will host a number of online meetings with you in which we will facilitate the discussions to produce a written list of your requirements based on SOP templates we provide. We can implement the interfaces by following our standard technical testing protocols or implement your own acceptance testing processes according to your local preferences.

Our solution includes configurable middleware that is widely used to integrate systems within the NHS, and which is fully compliant with NHS Digital's Interoperability Toolkit (ITK) specifications. Our clinical integration layer has been designed to closely align with the required specifications and standards. We send all of our messages using the Web Services transport mechanism, and our payloads are written in plain HL7. This enables our product to be interoperable with any clinical system supporting the same standard, and ensures we are entirely future-proofed, as HL7 is the industry standard format for healthcare messaging. We are currently interoperable with a range of EHRs, including:

- SystmOne
- CERNER
- EMIS

We are continually developing our APIs to expand the library of EHRs we can interoperate with, ensuring seamless integrations with a wide array of digital systems across the NHS.

Our solution uses industry standard messaging and queueing mechanisms using FIFO processing. Specifically we use the Apache Kafka queueing system - Apache Kafka is a distributed "publish subscribe" messaging platform explicitly designed to handle near real-time streaming data. It is a highly scalable messaging/queueing system with the ability to support massive volumes of event data. The system architecture inherently achieves failover due to its fundamental usage of replication, so in the unlikely event of a broker failure, the system recovers effortlessly and without interruption.

The middleware has robust error handling and retry mechanisms, with configurable logging levels and alert notifications. If any of our messages fail to be delivered, our system instantly alerts the configured user to the problem, with a description of error codes, timestamps, and failure reason. The frequency and maximum volume of these notifications are fully configurable. Failed messages will be retried a configurable number of

times before being moved into a suspended queue, where detailed information on failure reason can be viewed, the message can be re-submitted, or simply acknowledged and moved into an archive. The number of retries is configurable for each type of error code received. A maximum threshold for failed messages can be specified, after which the entire queue for that endpoint.

All patient identifiable data processed by our system is appropriately protected. Messages are sent using TLS encryption via HTTPS and data stored on our platform is protected using industry standard asymmetric AES encryption.

The platform is highly configurable in terms of what data is sent to our customers. Service definitions can be easily amended after initial setup, on a per customer (and even per endpoint) basis. The coding structure of each clinical system is taken into account, and each customer has full control over what data is delivered into their clinical system. Preferences for individual SNOMED codes, for example, vary between customers, and our platform allows for these preferences to be set on a very granular level.

Our referral application is linked directly to the NHS Spine through integration with the NHS Digital Personal Demographic Service (PDS). This means that once the referring clinician enters the patient's NHS number, the referral form will automatically retrieve the patient's demographic data from PDS. Clinicians can then also edit the data or add missing information. This guarantees effective use of the NHS number, whilst ensuring that the patient details captured in the form are those that are most up-to-date.

The service meets all the necessary standards for use in the NHS. For instance, our solution underwent a comprehensive evaluation by NHSX on November 2, 2021, affirming its full compliance with DTAC requirements. In particular, we achieved a 100% rating for Usability and Interoperability, underscoring our commitment to integrating with a vast array of EHR systems to facilitate a seamless transition into digital care for all NHS partners. We also achieved a 'Standards Exceeded' rating in our annual NHS DSPT (Data Security and Protection Toolkit) assessments, demonstrating our unwavering commitment to secure processing and storage of patient data. We are also compliant with ISO27001 security standards, and our software has been certified as a Class I regulated medical device.

Implementation support

Our service ethos is to work collaboratively with our clients as partners, so that they maximise the value for money they obtain from our services.

We will allocate a named project manager to work with you to ensure a smooth implementation. Internally, we use Jira project management software to ensure complex tasks are effectively delegated among team members and broken down into smaller, achievable components, so that all deadlines are met and there are no gaps in completion during project launch. However, we are method-agnostic as far as working with our clients is concerned, so we will adopt whatever methods, tools and techniques the client prefers (eg agile, PRINCE II, etc)

Our project manager, with the support of our in-house technicians and clinical staff, will work with you to define an implementation action plan. The plan will be based on a template we provide which has been refined over several deployments in the NHS.

The typical steps in the implementation will include:

- The initial planning meeting and agreement of the action plan
- A kick-off session with your clinicians

- Defining exclusion and inclusion criteria for eligible patients
- Training on deploying our solution
- Integration with Electronic Healthcare Systems
- Definition of the clinical pathways to be implemented as virtual wards, including established thresholds for clinical breaches
- Logistics arrangements for delivery of kits to patients
- Set-up and testing of the pathways
- Handover and sign-off of clinical safety management arrangements (DCB 0129 and DCB 0160)
- A go-live readiness trial with a small number of patients

Training and Associated Guidance

We provide comprehensive training in all aspects of the solution as an integral part of our service. The training is designed to introduce the user to all aspects of the service that are relevant to them so they gain sufficient familiarity and confidence to use the solution in accordance with their role. The training can be delivered through a range of formats, including 1:1 consultations, group workshops, through circulated written manuals, and online. We do not impose any limit on the number of training sessions conducted, and can arrange for more on an ad hoc basis depending on the client's needs.

The training is delivered in a dedicated training environment which is an exact replica of the functionality of the live environment. The duration of the training depends on the roles and aptitudes of the individuals being trained. Given the intuitive interface of our solution, a two-hour session is typically sufficient.

The training is delivered by experts who have practical experience in the implementation of virtual wards. This practical knowledge enables them to provide context-rich instruction, which significantly enhances the learning outcomes.

To ensure continuity in learning, we provide all training materials as videos for self-study post sessions, so that clinicians can refresh their knowledge when required.

Aside from training in the functionality of the solution, we can also provide training, awareness and coaching sessions delivered by our own clinical staff to cover aspects of best practice and lessons learned from other implementations of virtual wards.

Training will be delivered with full consideration of our clients' schedules. We can arrange for both group sessions and one-on-one sessions depending on availability, thus circumventing logistical difficulties associated with gathering an entire clinical team at once.

We provide all of the necessary information that our patients and clinicians require to make the best possible use of the services we provide. For clinicians we provide online access to comprehensive user guides which explain exactly how the service works, backed-up by easy access to one-on-one support from our helpdesk.

For patients, we pay particular attention to their information needs- a strategy that allows us to achieve exceptionally high levels of patient satisfaction and compliance, even among those who would traditionally be considered in the digitally excluded category (such as the elderly unfamiliar with internet and digital technology). We do not simply rely upon the instruction leaflets that are provided by the manufacturers of

medical devices, which can be hard to understand and often are full of extraneous information from the perspective of a patient. Instead we supplement the manufacturer's instructions with information sheets that are tailored to the needs of the patients on a pathway by pathway basis. For patients who may not have strong English proficiency, we can arrange for translations into over 150 languages by NHS approved translators. The instructions include step by step guidance about how to use, store and recharge devices, how to take and record readings, and how to obtain one-on-one help from our staff.

In addition to the information we develop ourselves, we can also provide patients and clinicians with access to whatever online information is relevant to their needs. At the outset of any project, when we are setting up a pathway, we will work collaboratively with our client to identify which sources of information should be presented to the patients (either sources developed by the NHS or from respected third parties).

The information sources can be made available to patients as simple context-relevant links to click in the app through which the patients access the service. The service allows you to create a library of information sources, grouped by theme, pathway etc, and to associate them with groups of patients (or individual patients). Links to the information sources are then displayed automatically to those patients associated with them. The information sources can also include near real-time information relevant to the patient. For example, we have incorporated local air quality readings and forecasts for asthma patients so they can make informed decisions about their daily activities.

Devices and Logistics

We are device agnostic, so we are happy to provide whichever devices are required and suit your local preferences. We can provide devices on a service basis, so that we retain ownership of them and responsibility for repair or replacing lost or damaged devices. We can also conduct our own product research and procure the most suitable devices to establish new and innovative pathways on the request of our clients. Currently, the devices we offer are:

- Mobile Phone
- Samsung Tablet
- Blood Pressure Monitor
- Pulse Oximeter
- Thermometer
- Peak Flow Meter
- Spirometer
- Weighing Scales
- Passive Monitoring Device
- 6-Lead ECG
- Activity Tracker
- Glucometer
- Cardiac Monitor

To support our clients in making informed decisions on which devices to deploy, we can provide an up-to-date list detailing the specific models of each device we have tested and approved for use with our app.

Note that it is only necessary to use an approved device where you require automated Bluetooth connectivity between the device and the app used by the patient. Where the patient is entering their readings or symptoms manually, they can use any suitable device as advised by your clinical team.

In addition to testing that the devices integrate successfully with our app, we also assess the devices for ease-of-use and their general suitability for patients (for example whether values displayed on devices are sufficiently clear for patients who might have poor eyesight, and so on). To maximise digital inclusion, we ensure all devices are selected in accordance with Web Content Accessibility Guidelines (WCAG) and that our smartphones and tablets have an in-built accessibility suite. Beyond this, we also place special emphasis on sustainability, ensuring that our procurement activity favours suppliers who can prove that their products are recyclable, carbon neutral and so on.

Depending upon the level of service you wish to provide to your patients, there are two broad options for deploying the app. The basic option is for the patient to use their own phone or tablet, and download the app on a self-service basis from the relevant app store. If you want to provide a higher level of service, we can provide the patient with a suitable smartphone configured and tested to work with our service. Importantly, that option allows us to incorporate software through which we can manage the smart-phone remotely. This allows us to reset settings if they are inadvertently changed by the patient, or provide enhanced support to help patients navigate the app during technical difficulties.

Our ethos is to provide an 'end-to-end' service in which we take care of almost every aspect of the delivery of the virtual ward, so clients can task-shift all operational dimensions to us and focus on providing care. We have invested in a dedicated warehouse facility that can process thousands of remote monitoring kits every month. The facility adheres fully and is inspected on the CQC requirements related to infection prevention and control and safe environments, including:

- Regulation 12: Safe care and treatment
- Regulation 15: Premises and equipment
- Regulation 17: Good governance.

Our in-house logistics team are experts in safe and effective circulation of devices: from functionality testing, to disinfecting, to tamper-proof packing in a clean room environment, to organising next-day delivery and efficient returns once the patient is discharged from the virtual ward.

We believe that logistical arrangements should be tailored to meet the needs of specific care pathways. Therefore, we offer various delivery options including dispatching Doccla boxes to hospitals and community hubs as well as sending devices directly to the patient's home. This hybrid model is ideal for accommodating speedy device delivery for a variety of clinical pathways, depending on whether the referral source is acute, community or primary care.

Help Desk

As standard, we provide a help-desk for patients and clinicians that can be contacted 7 days a week, 8am-9pm. Our help-desk platform has the ability to communicate via chat and chatbots, which we could implement if you required it; however, we find users and patients prefer direct contact with our staff. We can provide out-of-hours support as a separate option.

The help-desk is staffed in the UK by knowledgeable and friendly staff whose aim is to fix problems on the spot, rather than acting simply as call handlers (we do not outsource any of our help desk work, and ensure all

customer service agents are personally trained in properly addressing all range of queries). All our staff are DBS checked and receive regular training and updates on such matters as information security, equality and diversity.

Where we provide dedicated mobile phones to patients (which is our preferred option), we have the ability to control the phones remotely, which greatly improves the effectiveness of remote support and increases patient satisfaction with the service.

All support calls are logged and uniquely numbered and managed within the context of a formal quality management system.

We also operate in full accordance with DCB1605, establishing and recording any special communications needs of each individual patient. The support can be provided in languages other than English if required.

Onboarding and Compliance Monitoring

We can support the on-boarding of patients by contacting them at a pre-arranged time to talk through the steps they need to take to submit their readings for the first time. This will ensure that they understand how the devices work, how to use the app and so on. Where we provide a dedicated mobile phone for a patient, we configure it with software that allows the phone to be managed by us remotely, which allows for much faster issue resolution and higher patient satisfaction.

We also can monitor the submission of information by patients, and contact the patient proactively if they have not made a submission on time. This allows us to achieve exceptionally high patient compliance rates.

Clinical Monitoring

We employ our own clinical staff and therefore we are able to offer an additional level of service in which our clinicians provide a first level of monitoring of the patients on your behalf in accordance with an agreed written protocol. This can be especially useful in the following contexts:

- Firstly, the remote monitoring of patients can generate 'false alarms' where a patient's NEWS2 score or other indicator is outside normal limits because of factors not directly related to their health (e.g. they have taken their respiratory rate immediately after some vigorous exercise rather than waiting for it to return to normal levels). We can filter these misnomers out by having our clinical staff contact the patient to check whether the alarm is genuine before your clinical team unnecessarily sinks invaluable time responding to it.
- Secondly, our clinicians can help you fill gaps in your rota, especially out of hours, during busy periods or when you have staff absent for whatever reason

Clinical Safety

We comply in full with DCB 0129, and our Clinical Safety Officer will support your implementation of DCB 0160 as part of our support service. We have a long established clinical safety management system, which is owned by a dedicated Clinical Safety Officer, with oversight from our Chief Medical Officer.

We have integrated specialist, risk and compliance software within our managed service workflow to:

- Automate alerts for potential safety issues or adverse events based on predefined criteria.
- Utilise risk assessment algorithms to evaluate the severity and likelihood of adverse events.
- Streamline the reporting process by automating workflows, reducing manual data entry, and ensuring timely reporting.
- Ensure that clinical safety reports comply with regulatory requirements and standards.

References

Our virtual ward has been deployed at many NHS sites, in both acute and community settings. We can provide excellent references from any of our clients on request. We have thrice been shortlisted for the HSJ Partnership Award which recognises excellent working partnerships between the NHS and suppliers, and recently won the Bronze Award under the 2023 Virtual Care Project of the Year category for our partnership with Bristol, North Somerset and South Gloucestershire (BNSSG).

Bespoke Reporting Capabilities

As standard, we will provide daily, weekly and monthly anonymised service usage reports to support management decision making. The standard metrics available include:

- patients active end of day/week/month
- patient active days
- patients onboarded
- failed onboardings
- patients re-onboarded
- patients discharged
- average length of stay (at discharge)
- patients paused (readmitted)
- patient day compliance
- scheduled day compliance
- % red alerts

For ease, we email these reports directly to assigned users NHS emails so the information is readily available. In addition to receiving the reports by email, nominated recipients can also view the reports online via 'Looker Studio' (a reporting viewer from Google) provided they have a compatible email address that allows login to Google services.

We also have a dedicated Data team who can develop bespoke clients for reports, including annual reviews of the service. They have thousands of data points at their disposal which they can analyse in a variety of ways to support your strategic decision making.

For example, we recently provided a partner ICB with a heatmap report of escalations that broke down the number of alerts resolved by their clinicians. As a consequence, we jointly created training materials for clinical staff to support appropriate triaging experience by drawing on our extensive remote patient monitoring expertise. We also provided refresher training to staff so they could personalise thresholds for patients and thereby avoid inappropriate alerts. The report also indicated the frequency of alerts at specific times in the day, and was used by clinical operational leads to forecast their staff rota requirements for winter and preemptively avoid staffing shortages. Ultimately, the report was leveraged to inform strategic decision making and improve operational efficiency. Thus, our reports provide incredibly valuable insights into the ward's operational challenges, thus informing strategic decision making to enhance efficiency across our remote monitoring pathways.

Inreach Nurses

To support patient referral onto the service and ensure virtual ward capacity is being utilised to its full potential, we can also draw upon our clinical expertise and provide a team of CQC-registered inreach nurses to:

- Audit careflow daily to identify suitable candidates for monitoring.
- Undertake initial referral assessments with patients.
- Support clinicians to make best use of the service.
- Work with the NHS@Home coordinator to understand daily community-based capacity and use this to inform referrals.
- Upskill clinicians on assessing suitable patients, and managing pushback and challenge from consultants.
- Identify opportunities to diversify the departments who are referred to the service

We provided this service to support one of our NHS partners in maximising virtual ward capacity. It proved to be resoundingly successful, generating a 37% increase in patient onboardings within two months. Given its proven effectiveness, the service was procured as a permanent function of the virtual ward, and our inreach team continues to support the NHS clinical team in identifying suitable patients to transition into home-based care.