

Case study

Sensyne Health

How Oxford University Hospitals NHS Foundation Trust was able to improve patient outcomes using SEND™ to send real-time data to the HSCN

Overview

Challenge

- Reduce emergency situations and improve patient outcomes
- Improve monitoring and recognition of patients' vital signs in real-time
- Unable to connect to the HSCN to securely send patient data

Solution

- Sensyne's SEND™ application for logging patient vital signs data in real-time
- Host SEND™ in Microsoft Azure for scalability and elasticity in the cloud
- Connectivity solution from Cloud Gateway to send patient data securely to the HSCN

Impact

- Equivalent of 3.5 full-time nurses' time delivered back to the hospital every 24 hours
- Clinical care of over 200,000 patients has been enhanced
- Cardiac arrests reduced by up to 63%

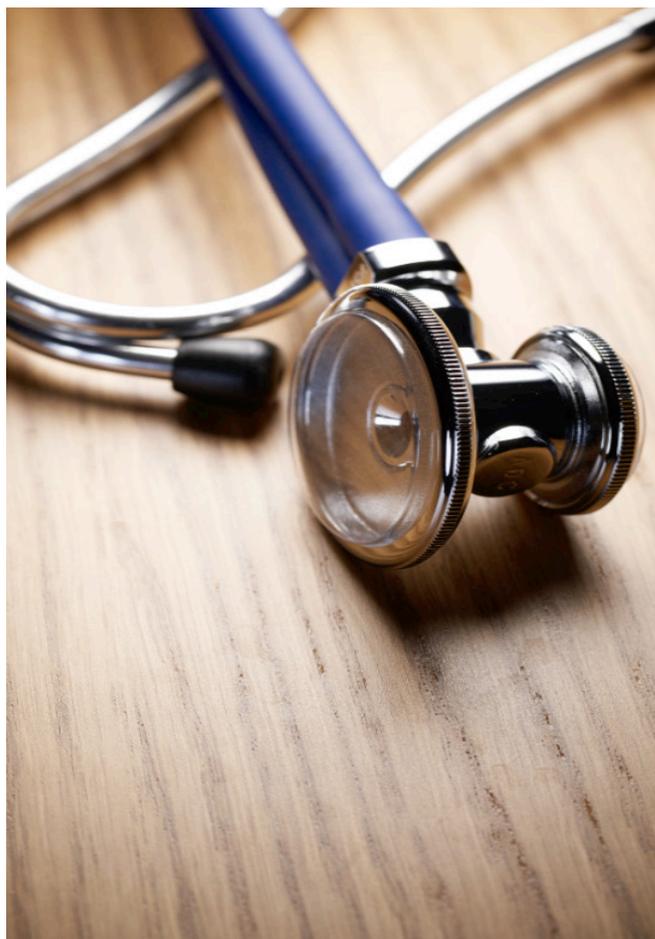
Sensyne Health plc is a healthcare technology company that creates value from accelerating the discovery and development of new medicines to improve patient outcomes. It does this through the analysis of real-world evidence from large databases of anonymised patient data in collaboration with NHS Trusts and the development of clinically validated digital health products which help clinicians deliver better patient care.

The Challenge

There are estimated to be over 10,000 avoidable in-hospital deaths in the UK each year alone¹. Improved monitoring and recognition of patients' vital signs and earlier intervention is widely recognised as a key step to prevent avoidable mortality.

To address this, Oxford University Hospitals (OUH) NHS Foundation Trust had implemented a paper-based "Early Warning" system in the hospital, which aimed to recognise and monitor deteriorating patients' vital signs by scoring their results. The Trust quickly realised the limitations of a paper-based approach. Patient charts weren't immediately available and it took time to share the data with clinicians. Also legibility of notes was sporadic and the calculation of scores frequently produced errors.

Very quickly, the Trust determined that in order to be able to swiftly recognise early warning signals, receive data in real-time, prioritise patient care and improve patient safety, an electronic solution would be needed. The Trust engaged with Sensyne Health to build a digital solution.



The Solution & Implementation

Together with Oxford University Hospitals (OUH) NHS Trust, Sensyne Health developed a web-based software application - The System for Electronic Notification and Documentation (SEND™). The software allows health professionals to monitor patient health within medical facilities via tablets and bedside devices which display early warning scores for clinicians.

As well as in-hospital monitoring, the software allows patients to enter their own data in to

mobile applications for remote monitoring and improved patient safety outside of the Trust's facilities.

Originally, the SEND™ application had been hosted by an incumbent supplier, however, their ability to scale the software was being impeded, due to the limitations associated with hosting on physical tin.

Sensyne identified the need to move to a cloud-based platform to allow them to harness the scalability and elasticity of a cloud built application.

Crucial to their success, they needed SEND™ to connect consumers of the application within NHS Trusts to the Health and Social Care Network (HSCN) to be able to securely send the patient data for monitoring. Their incumbent supplier lacked HSCN connectivity and associated security requirements.

Without a cloud connectivity solution, it was very difficult to implement their plans. A fresh perspective was needed.

Three key criteria for the solution needed to be met:

- **Secure cloud connectivity** - to reach the application built in Azure
- **HSCN accreditation and connectivity** - to reach consumers on HSCN
- **Speed to market** - fast deployment to meet consumer demand

Sensyne chose Microsoft's Azure cloud platform to migrate the solution to. However, they needed to fix the HSCN connectivity piece.

Microsoft called upon Cloud Gateway (part of the Microsoft Partner Network) to offer a potential solution.

As experts in cloud connectivity and networking disciplines, Cloud Gateway were able to cut through the complexity of the task at hand, working closely with Sensyne's engineering teams to provision and test before launch.

Cloud Gateway's hybrid cloud connectivity PaaS solution, PRISM, was able to provide secure HSCN connectivity plus reach their application in Azure via private connections in UK data centres - essential for the project's success and to enable a much faster time to market.

PRISM also facilitates secure internet connectivity, something Sensyne had identified as a need for future phases of development, on a global scale.

An integral part of Cloud Gateway's PRISM hybrid cloud connectivity platform offering is being connected to the Equinix Cloud Exchange (ECX) Fabric™. Underpinning the PRISM platform, the ECX Fabric™ provides the flexibility to support a genuine multicloud strategy, while Equinix's rich, extensive ecosystems and 200+ global data centres ensure interconnection everywhere. Cloud Gateway's physical footprint is strategically positioned within Equinix's London LD8 and Manchester MA3 data centre campuses.

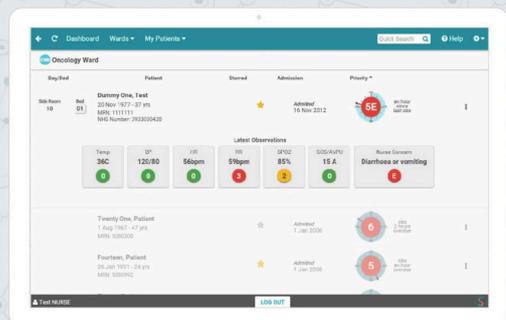
Connection to the ECX Fabric™ brings access to multiple cloud services with a choice of over 1,700+ network and 2,900+ cloud and IT service providers to connect to, while Cloud Gateway maintains pace and keeps costs low.

Being positioned in Equinix's data centres allows Cloud Gateway to offer further access to HSCN and ECX services. With the Sensyne Health project, Cloud Gateway has been able to use these services to bring together the final connectivity solution. Not only can services be delivered from cloud on-net straight through to the HSCN, but customers and other health service suppliers can reap the benefits of a future-proof, interconnected solution.



One of the most amazing things that I have had the pleasure in being involved in

- Senior Nurse, Churchill Hospital
OUH NHS Trust



Impact

The application is now able to provide a real-time overview of patient data and consumers of the application can connect to it via the HSCN. Data and results are displayed in a simple and clear format so that patients and their families can easily understand.

Patient records are immediately available to clinicians, remote consultants, the nursing station in the Trust's facilities and via remote monitoring, rather than only being accessible at the bedside. Clinicians are able to prioritise patients based on real-time results and complete health records, which allows them to manage their time more effectively.

Patients are benefiting from immediate identification of their condition and vital signs are being shared and monitored as part of normal clinical care, rather than in an emergency situation.

To date, 33 million observations have been recorded using SEND™, with a 30% reduction in time to undertake a set of vital signs observations.

This has lowered nursing workload as well as improved documentation quality. The time saved has released the equivalent of 3.5 full-time nurses back to the hospital in every 24 hour period. Hospital nurses are able to spend more time providing care to patients instead of doing administrative tasks.

As a result, the care of over 200,000 patients has been enhanced, specifically with cardiac arrests being reduced by up to 63% to date in two NHS Trust hospitals.

Cloud Gateway offers Sensyne a future-proof solution enabling further development in the cloud. Speed of deployment and cost effectiveness means that Sensyne can invest these savings in to further software and product development which will enable huge increases in improved patient outcomes.



1 Hogan H, Healey F, Neale G, Thomson R, Vincent C, Black N. Preventable deaths due to problems in care in English acute hospitals: a retrospective case record review study. *BMJ Qual Saf.* 2012; *bmjqs-2012.*

About Cloud Gateway

Cloud Gateway provides a truly cloud-native hybrid cloud connectivity platform (PaaS) which securely connects anything on your estate with multiple cloud service providers, the PSN, HSCN and the internet.

The Cloud Gateway platform allows organisations of any size to harness the power and flexibility of hybrid cloud and multicloud but with greater control, pace and visibility. Cloud Gateway secures all your internet and network traffic, with built-in flexibility to address continuous and future change and reduce your operating costs. By centralising connectivity, organisations have a single, timely and accurate source of truth, ensuring regulation and legislation compliance and protecting you from cyber threats.

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