Industry	Business Issue	Solution	Benefits
Healthcare	Royal Brompton & Harefield NHS Foundation Trust needed a single view across its hundreds of databases to improve patient care, discover clinical correlations, and deliver greater compliance.	SAS® Visual Analytics.	Analysing large volumes of patient data can now be done in a fraction of the time, and correlations are easier to find. Reporting is now more accurate and efficient.
Focus Big data analytics			

Analytics on the frontline of saving lives

Big data improving patient care at Royal Brompton & Harefield NHS Foundation Trust

Since its creation in 1948, the NHS has grown to become the world's largest publicly funded health service. Made up of hundreds of different trusts, it now faces the biggest challenge in its history as it looks to fully embrace the digital age. Responsibility for doing so rests with the individual trusts and, with the goal of a 'paperless' NHS by 2018 set by the UK government, the time for action is now.

Royal Brompton & Harefield NHS Foundation Trust is at the forefront of this evolution. With just under 500 beds, the trust specialises in surgery and medical care for heart and lung conditions. It carries out major heart and lung transplants, and its facilities include intensive and high-dependency care units. Throughout the years it has accumulated a huge amount of clinical data, with digital data increasing dramatically in recent times. Most of this data is disconnected and held in multiple databases. The trust has chosen SAS® to help transform its fractured network of siloed information into a single data warehouse where insight and analysis could lead to better patient care.

Big data analytics reveal clinical insights

"The hospital has in excess of 400 data systems and 20 critical clinical data sets," explains Joanna Smith, Chief Information Officer, Royal Brompton & Harefield NHS Foundation Trust. "We have access to a wealth of information that we have to capitalise on, so we can deliver services better suited to the individual needs of each patient.

Evidence-based decisions that draw on all the available data are essential to achieving this."

SAS not only helped bring data from all these sources together; it has allowed medical staff to reveal clinical correlations that were previously unknown. Cohorts, or groups of patients in a study, can now be easily analysed for things they share, revealing insights that may otherwise have been obscured by the size and complexity of the data. It is this that has the potential to impact the lives of both the staff and patients of the hospital.

"'It will now be possible to identify patient cohorts with specific conditions and analyse them by age, management plan and outcome," says Cliff Morgan, Chief Clinical Information Officer at Royal Brompton. "We can look at what the correlation is between prescribing antibiotics and the outcome. We've looked at this sort of analysis mainly with heart attack patients. Previously it was very labour intensive – people in a room for three to five days collecting this sort of information. Now we can do this in five minutes."

Privacy is paramount, speed is key

The benefits of the new system are not just clinical. Public concerns over the digitisation of the NHS often centre around privacy, and the sensitive nature of the information involved means the Trust must take particular care in dealing with patient data. The Clinical Data Warehouse (CDW), where information is now centralised, adds another layer of privacy for the patients of Royal Brompton. Data is accessed via a clinical dashboard, giving staff the information they need at their fingertips, while at the same time ensuring patient confidentiality.

"Unless there's a need to look at individual data, all the data is anonymised, which is a big change," says Morgan. "Previously a cardiologist may get three or four junior doctors to look at 400 case notes on paper. Not only is that incredibly time-consuming and labour intensive, but all the data is linked to individual patients. Now, using SAS, confidentiality is completely protected."

The speed and accuracy with which this data can now be analysed, combined with the resources freed up as a result, will have potentially life-saving consequences. In the short term, doctors can start to look at tailoring treatments for different patients, using the data they already have. They can avoid drugs with certain toxicities that certain patients could be susceptible to, or have confidence in a new course of treatment based on success in the past. These changes won't make for better surgeons, but they may make doctors better at prescribing medication.

Improving patient outcomes is at the core. Through powerful analytics, clinicians will be presented with valuable insight and predictions about the patient, based on their evidence, enabling better interventions and potentially more rapid diagnosis and treatment. Discharge letters, for example, rich with medical information, will have their text "translated" into actionable content in the CDW and available to medical staff on desktops and mobile devices.

The future: Prevention as well as cure

In the longer term, SAS has the potential to help medical staff prevent, as well as just cure, diseases. "We don't know the less obvious correlations," says Morgan. "We would not previously spend time looking at records to find unexpected outcomes. However, now we can. Once these have been identified, we can then start looking for potentially bad outcomes before they occur, and take measures to prevent them happening. Often we make decisions as to whether a patient should have a particular treatment or intervention at point A or point B in time. A lot of these decisions are based on wisdom, judgement and experience. But, in addition, we should have some information about the particular cohort the patient is in, to help this decision-making process."

With lives on the line, the reliability of data is absolutely crucial. And like all NHS trusts, Royal Brompton is measured on its performance. It needs to be able to pull accurate and audited data, and its ability to do so is a key component of its overall assessment. "We need high-quality data available straight away, but it can take a long time to crunch that data," says CIO Joanna Smith. "Now, we have the capacity to be much more accurate and efficient in our reporting, which not only helps us day to day, but ultimately leads to greater patient care down the road."

SAS gives Royal Brompton & Harefield NHS Foundation Trust THE POWER TO KNOW®.

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