



A New Chapter

Royal Papworth Hospital

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"Royal Papworth provides leading-edge innovation in its field and we wanted to use technology that reflected this, with the ability to move and evolve as we move and evolve. Mindray's solution offered the greatest scope to achieve this."

Paul Robbins, Electro-medical Services Manager, Royal Papworth Hospital



History in the making

Overview of Royal Papworth and its journey

Royal Papworth Hospital is the UK's leading heart and lung hospital, treating more than 100,000 patients each year from across the UK. Since carrying out the UK's first successful heart transplant in 1979, the hospital has established an international reputation for excellence in research and innovation. The hospital performs more heart and lung transplants than any other UK centre, which also makes it one of the leading cardiothoracic transplant centres in the world.

As part of a project to modernise the hospital facilities, a new state-of-the-art building has been built – relocating services from the Papworth Everard site, to the Cambridge Biomedical Campus, adjacent to Addenbrooke's Hospital.

As most patients will have their own single, en-suite rooms, there will be significant benefits in terms of patient privacy and infection control. However, managing patients in this single room environment requires careful consideration. The hospital has installed a state-of-the-art monitoring solution, from Mindray, to provide the highest levels of visibility and clinical insight, ensuring patient safety throughout the patient's journey.

The new Cambridge Biomedical Campus opened its doors to its first elective surgery patients, as well as heart attack patients on the 1st May 2019.

Key facts:

Royal Papworth Hospital has:

- + 5 operating theatres
- + 5 catheter laboratories
- + 2 hybrid theatres
- + 6 inpatient wards
- + 46-bed critical care unit
- + 300 patient beds
- + Over 250 single, en-suite patient bedrooms
- + A specialist respiratory support and sleep centre
- + Treated 24,291 inpatients and 92,245 outpatients in 2017/18
- + Over 400 Mindray BeneVision N Series monitors



Patient safety at the heart of Royal Papworth

Comprehensive monitoring throughout the patient journey

Mindray UK has worked collaboratively with the prestigious hospital to develop a bespoke, fully connected patient monitoring solution to ensure close monitoring of patients across hundreds of single patient rooms. The state-of-the-art system will not only enhance patient safety, but also create efficiencies and improve the quality of data captured.

The flow of patient data directly from the monitors into the hospital's information systems means there is less need for manual input and provides visibility of patient data instantly from any location within the hospital.

Early warning scores

Caregivers are now automatically alerted of patient deterioration, according to National Early Warning Score (NEWS2) guidelines. NEWS2 aims to save lives by standardising the assessment and response to patient deterioration. By automating the process using Mindray BeneVision monitors, Royal Papworth has been able to reduce human errors, speed up response times and improve patient safety.

As a specialist heart and lung hospital, Royal Papworth's cohort of patients have a different physiology to other hospitals. Mindray refined the NEWS2 display to enable clinical teams to view additional parameters that are important to the hospital, including: Emesis (sickness), pain score and inspired oxygen.

Integration with mobile alarming devices is also allowing senior clinical staff to be alerted and respond in the event of patient deterioration, providing a 'safety net' for nurses caring for patients in the single, en-suite rooms.

The monitoring solution:

- + 400 BeneVision N Series monitors, from N12 to N19
- + 16 workstations
- + 5 BeneVision central stations
- + 3 eGateways
- + 12 slave screens for the theatre department

Seamless monitoring

A key benefit for Royal Papworth is the ability for the N1 monitor to follow the patient throughout their care journey, helping improve safety and efficiency. When the patient is moved, the Mindray module simply unplugs from the side of the monitor and can be used as a transport monitor. It can then be 'plugged' into the host monitor at the bedside, at the new location. This means there are no leads to disconnect and reconnect, or clean between patients, and the patient is continuously monitored – ensuring seamless data and patient safety at all times.



Freeing time to care

The ability to perform 12-lead ECGs with the Mindray monitoring system has also created efficiencies for Royal Papworth. Previously this process would involve finding an ECG cart, printing the ECG onto paper, taking it to a doctor to get it signed, scanning it, then putting it into a file. Now, caregivers can perform a 12-lead ECG at the bedside and automatically send it to a file share, creating a huge time saving for clinical staff. As there is no need to leave the patient it is also much safer.



Key outcomes

- + The hospital now has comprehensive patient monitoring, throughout the patient journey, reducing the gaps in data to ensure maximum patient visibility and safety
- + The flow of patient data directly from the monitor and into the EPR improves safety and releases time to care, through more efficient workflows and the reduction of manual transcription
- + Staff can now avoid patient misidentification at the point of care, with positive patient identification on-screen via ADT lookup
- + Staff and management are now confident in the accuracy of the observations and NEWS2 calculations, ultimately helping save lives
- + Enhanced patient safety through rapid identification of deterioration, the automated notification process is helping to speed up intervention by the outreach team
- + Integrated 12-lead ECGs has created time efficiencies and eliminated the need for standalone ECG devices, maximising the investment and streamlining equipment inventory
- + Streamlined equipment in theatre, integrating multiple third-party devices into a single display



Clinical and technical approval

A solutions driven approach

A winning combination of Mindray's state-of-the-art technology, a flexible approach to developing bespoke functionality at record speed, and the willingness to go "the extra mile", has resulted in high levels of clinical approval. Mindray worked closely with clinical stakeholders to understand their requirements and deliver solutions tailored to the needs of Royal Papworth's unique patient population.

Head of Nursing, Cheryl Riotta, noted that the support provided by Mindray's team was "exceptional". During the move from the old site to the new hospital, a total of six Clinical Application Specialists from Mindray were on hand to support the transition – ensuring the process was as smooth as possible. Clinicians were also provided with hands-on training on the monitors and the NEWS2 functionality, throughout the project, ensuring staff felt confident in using the new technology.



"Mindray has taken the installation to the next level, by programming NEWS2 into the monitoring equipment and transmitting observations directly into our Electronic Patient Records via the eGateway – this is a huge advantage."

Eamonn Gorman, Chief Nursing Information Officer and EPR Manager, Royal Papworth Hospital

"We worked with Mindray to develop a slick and sensible monitoring setup, and the support that Mindray gave us was exemplary."

Dr Florian Falter, Consultant Anaesthetist, Royal Papworth Hospital



Connectivity and interoperability

Mindray devices have become the data hub

Interoperability between Royal Papworth's new monitoring and its hospital information systems is allowing clinicians to use patient data more intelligently, to inform clinical decisions, enhance clinical efficiency and improve patient outcomes.

The flexibility of the solution is made possible by the BeneLink Interfacing Module. By becoming a 'data hub', BeneLink has streamlined equipment in theatre, integrating multiple third-party devices into a single display. This allows simultaneous viewing of a variety of parameters for rapid insight into the patient's status. Cardiac output and a variety of other critical data can be displayed on the monitor screen, helping to inform clinical decisions, enhance clinical efficiency and ultimately improve patient outcomes.

On-going development and close collaboration with clinical partners at Royal Papworth will ensure the technology remains cutting-edge and evolves with the changing demands of the hospital for years to come.

Integrations at Royal Papworth:

- + Lorenzo – main electronic patient record system
- + Metavision – clinical information system for ICU
- + M-ighty – e-observations and alerting system
- + 12-lead ECG PDF to Lorenzo
- + Serial output to Liva Nova heart-lung perfusion system
- + GE Aisys CS2 anaesthetic machine with waveforms

"I don't know of many companies that are capable of turning around this type of project at this speed. We knew that their R&D team were good, but I have still been surprised at just how quickly they delivered on our integration requirements. They have been phenomenal!"

Eamonn Gorman, Chief Nursing Information Officer and EPR Manager, Royal Papworth Hospital



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