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Improving safety for neonatal patients

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East Kent Hospitals University Foundation Trust has improved safety for neonatal patients and transformed workflows, by implementing an Sp02 dashboard.

What started as a project to clarify inconsistent SpO2 data during patient transfers has triggered a workflow revolution for the Special Care Baby Unit (SCBU) at Queen Elizabeth The Queen Mother Hospital (QEQM).

Working with Mindray's clinical applications team to create an oxygen therapy tool tailored to its neonatal requirements, QEQM has cut the average length of stay for patients, delivering babies back to parents faster than ever.

Oxygen saturation levels is one of the key parameters measured in the SCBU, requiring consistent data throughout the baby's journey from the High Dependency Unit (HDU) to the SCBU. Current National Institute for Health and Care Excellence guidelines place target saturation levels at between 91% and 95% for preterm babies, with anything lower than 91% posing an increased risk to mortality.[1] So, when the unit began to see differences in SpO2 data after transfers, it knew a more precise oxygen therapy tool was required.

After an initial trial period, QEQM received eight Mindray ePM patient monitors for the SCBU as part of a Trust-wide purchase by East Kent Hospitals University Foundation Trust. As well as delivering more accurate and substantiated saturation data than the previous machines, the ePM devices also offered customisable neonatal monitoring. During the installation the devices' neonatal dashboards were configured to meet the unit's unique oxygen therapy needs, allowing staff to track patient performance for longer and in greater detail.

Tracey Twyman, ward manager for East Kent Hospitals University NHS foundation Trust (second from left), with the QEQM neonatal team

Reducing the need for sleep studies

When a baby remained on oxygen for an extended period of time, the SCBU would carry out an in-depth study for the affected neonate, which would often have to be repeated for accuracy. These studies would often last an average of four days each and involve posting data to the unit's sister site for downloading and analysis. This meant the average length of stay for affected babies was eight days, totalling £3,200 per baby.

The new devices have since helped generate a 95% reduction in time-consuming sleep studies, delivering an estimated cost saving of £32k per annum.

QEQM performed 22 studies in 2019 but has only carried out one so far in 2020. This sharp decline in studies is a result of the ePM's specialised neonatal dashboard, as Tracey Twyman, ward manager for the Trust, explained:

"The new neonatal saturation screen has significantly reduced the number of formal sleep studies we are performing. It has enabled us to wean babies from oxygen safely and more effectively and has meant babies do not have to remain in the unit for longer than necessary."

A specialised oxygen therapy tool

QEQM worked closely with Mindray to create its own unique goal management tool for oxygen therapy on its new monitors. The personalised neonatal dashboards now allow the consultants to make discharge decisions at the bedside, collecting all the saturation data they need into one screen. The ability

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> Tracey Twyman, ward manager, East Kent Hospitals University Foundation Trust.

to take in all their key data at a glance has dramatically improved workflows and helped to deliver babies back to their parents faster. It has also given time and beds back to the consultants, as decisions are swifter and backed by multiple targeting metrics.

With such vulnerable patients at varying levels of stabilisation, the unit also identified the need of more precise individualised targeting. SpO2 target tracking is now defined into precise high and low limits for each baby, through an easy-to-read sliding scale graphic. This level of personalisation and accuracy has improved patient safety at an individual level and allowed staff to track minute changes in saturation levels for a more precise and holistic view of patient performance.

Mindray clinical application specialist Mike Hearnden supported East Kent throughout the configuration and installation process. "We work with very flexible devices, which means customers can choose a high level of customisation," he commented.

I worked closely with the East Kent team to first understand their clinical objectives and preferences, then built on this within the ePM's range of capabilities. Their specific parameters were configured to obtain and show data in a way determined by their medical team, from graphic displays right down to colour coding."

Twyman added: "Mike was exceptional in sharing his neonatal knowledge and expertise, enabling us to get the full potential from the neonatal saturation screens."

The SCBU can also spot trends and employ precision target tracking for longer periods of time. The ePM's extensive data storage capabilities allows staff to enter target saturation levels and track patient performance within a selected time duration (up to 48 hours). With such detailed tracking, consultants can review trends and make a more informed discharge decision based on historical data displayed on one screen.

QEQM hospital

Actionable data with proven accuracy

As well as monitoring oxygen saturation levels, the ePM devices also track Perfusion Index (PI) for a pulsatile reading that validates the recorded SpO2 data. This level of validation empowers staff at QEQM to react to the data on screen, reducing the need for further checks and sleep studies in the process. Having greater independence and confidence in decision-making has also limited the potential exposure to delays during the sleep study process.

Along with the neonatal dashboard, target tracking, and the more holistic picture of patient performance, this new level of data accuracy has been recognised and adopted in other parts of the hospital.

"The consultant team have been so impressed with the new data that they can review on the ward round each morning that we have now updated our HDU monitors with the same technology," commented Twyman.

By choosing the ePM, the Trust also ensured a smooth and reliable data transfer process with its existing Mindray devices, creating one standardised SpO2 measurement across the Trust in neonatal environments.

Key outcomes

East Kent has fundamentally improved patient care for some of its most vulnerable patients, giving parents more time with their new-borns. New babies entering the unit are now supported by a smooth and safe transfer process, involving consistent saturation data which can be easily examined and monitored by staff at the bedside. Upon arrival, custom Sp02 targets can be set for individual babies and tracked through the night for morning analysis, resulting in a faster discharge decision.

Empowering the unit with these actionable saturation readings and customisable targets has improved patient safety at an individual level and as a whole, saving money for the Trust by shortening the average length of stay in the process.

After recognising the software's potential, and the ability to deliver such a significant improvement, the Trust subsequently decided to install the neonatal dashboard on all monitors in its HDU. CSJ

Reference

1 NICE, Specialist neonatal respiratory care for babies born preterm, Quality standard [QS193], 15 July 2020.

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