dispensing times was not by chance.

Review of the SPC I-chart for prescription dispensing times (Figure 3) found that in phase 1, although dispensing times were longer there was less variability between data points. In phase 2, although the mean dispensing time had reduced, none of the rules for special cause variation could be applied, possibly due to the smaller sample size.

A Mann–Whitney test was performed on the dispensing times and resulted in a p-value <0.00001, suggesting that the elimination of the paper controlled drug register is significant in terms of efficiency gains.

Further analysis of the dispensing steps using the ADC found on average 36 seconds per transaction was saved during the selection and assembly phase. This can be attributed to ADC technology, which uses a series of guiding lights to direct the dispenser to the required bin location.

The primary objective of this project was medication safety and therefore patient safety; the layout of the ADC was enhanced to optimise risk minimisation strategies, this included configuring all controlled drug items to individual bins or zones. The RVH Pharmacy ADC system was the first in the UK to implement this design approach.

Errors and documentation
In the three-week period prior to installation of the ADC, an error-recording log was designed to record controlled drug-related errors including documentation, issuing or selection errors. An error rate of 24 errors per 1000 items dispensed was calculated; analysis of the errors recorded found that 82% were attributed to documentation, subtraction errors in running balance or omitted entries. It took 135 minutes to correct the documentation errors.

In the three-week period immediately following implementation of the ADC, the electronic controlled drug register was reviewed and an error rate of 9 errors per 1000 items dispensed was calculated. The errors recorded were categorised as operational, for example, wrong quantity selected on pharmacy dispensing system or counting errors. These errors were communicated to the team and operating protocols were revised to ensure staff were clear on management of procedural issues. The interface between the pharmacy dispensing system and electronic controlled drug register eliminated previously noted documentation errors.

The BHSCT extended hours seven-day pharmacy service is delivered by the RVH Pharmacy department with staff from four pharmacy departments contributing to the weekend and evening rotas. Prior to the implementation of the ADC staff reported that controlled drug tasks were difficult and stressful particularly at weekends. Contributing factors were a high volume workload, and range and complexity of controlled drug dispensing, which led to documentation and discrepancy errors. There was staff dissatisfaction with the manual dispensing process and recognition of the potential risk of picking the wrong injection, including incorrect ampoule size or strength. All of these factors influenced the department’s ability to achieve key performance targets for dispensing times.

Following implementation of the ADC, staff reported liking the layout of the cabinet, noting it was easy to use and felt safer as every item...