A&E Patient Monitoring System

New A&E ‘traffic-light’ based monitoring system allows staff to avoid breaches of the 4-hour rule and tracks patients in real-time as they are moved around the hospital.

The Client
Established in April 2000, the East and North Hertfordshire NHS Trust manages three busy hospitals: Hertford County in Hertford, the Lister in Stevenage and the Queen Elizabeth II in Welwyn Garden City. In addition, the Trust also has management responsibility for the Mount Vernon Cancer Centre in Northwood, Middlesex.

Between them, the Lister and QEII hospitals provide a wide range of major acute surgical and medical inpatient services, including A&E, critical care and maternity. They also provide care to people on an outpatient basis, as well as ante/postnatal, radiology and pathology services.

With resources of around 5000 staff, an annual budget of £240 million, and 860 inpatient beds, the Trust serves 500,000 people in South East England. Of those, well over 376,000 patient visits are made to the Trust’s outpatient departments every year and 55,000 patients are admitted for care.

No patient should spend more than 4 hours waiting in A&E departments - from arrival to admission, transfer or discharge - other than in exceptional circumstances.

NHS Plan for England

The Client’s Problem
The length of time patients have to wait in Accident & Emergency is one of the key issues for the health service and much effort has been put into improving these by hospital trusts. In line with recommendations made in the Government’s NHS Plan for England, a ‘see and treat’ incentive scheme has been in place since 2004 aimed at reducing A&E waiting times:

No patient should spend more than 4 hours waiting in A&E departments - from arrival to admission, transfer or discharge - other than in exceptional circumstances.

Meeting national targets for keeping within the recommended 4 hours has meant a cash incentive to trusts of £100,000 to spend on capital projects.

Clinicians agree that almost all patients attending an emergency department could be assessed and either discharged or admitted within four hours if appropriate systems and processes were in place.

However, before a patient in A&E is admitted into hospital for further care, transferred or discharged, there can often be a lengthy chain of decisions, tests and treatment.

When delays occur at any or all of these stages, long waits in A&E can result.

Some A&E departments have set up clinical decision units (CDUs)
or have access to medical assessment units (MAUs) to speed up the process of investigation and assessment of patients. Other A&E departments are concentrating on improving access to diagnostic facilities and equipment, or improving pre-admission and assessment processes, or building up better information on why and where bottlenecks are occurring.

Key to all these measures is ensuring that patients waiting times are properly monitored to avoid breaching the 4 hour window.

The Challenge

Teri-ann Grange, who works for the East & North Hertfordshire NHS Trust as its I.T. Projects Manager, needed a way to monitor and reduce the incidence of breaches to the 4-hour waiting limit in its A&E departments.

The Trust had previously been recording patient information on a whiteboard to monitor the amount of time patients spent in A&E for assessment, treatment or a medical decision.

Ideally, Teri wanted a new patient monitoring system which would render breaches less likely. If successfully implemented, Teri-ann planned to roll out the system to the A&E department at Lister Hospital - and once proven stable, into further A&E departments in Lister and on to the Queen Elizabeth II in Welwyn Garden City.

Called Klok, the project was put out to tender and won by Blueberry Consultants.

The Solution

Blueberry Consultants designed and completed the Klok system in 4 months, using a combination of VB, ASP, IIS, MS and SQL Server technologies.

Klok uses a “traffic light system” of green - yellow - red - black colour coding to determine how long a patient has been waiting, and consists of:

1. An interface to the Patients Administration System (PAS).
   - This interface can accept data from the PAS and automatically stores it in the Klok patient database.
* Patient details from the PAS are stored in this database along with subsequent comments and modifications by the A&E staff.

3. **An interface for the A&E staff which is via a website.**

* The website provides five main features:

  a. A “Whiteboard” display showing all the patients in the department along with details such as name, time arrived, doctor etc. A colour coded ‘traffic-light’ display is used so that staff can quickly identify how long each patient has been waiting and if breach is likely.

  b. A “Desktop” display which is used to edit patient details and to transfer patients between areas within the A&E department.

  c. A “Medical Records” feature which is used to automate the requests for patients’ medical details.

  d. Administration screens which are used to define system parameters such as doctors names, department names, user logins etc.

  e. A reports area which allows a user to generate reports on the number of patients who exceeded the 4 hour wait time and a summary of the doctor’s workload.

Teri-ann Grange said: “The new Klok system allows staff to monitor the A&E department in real time, and to review and change any procedures that lead to breaches of the 4-hour rule. It also allows staff to track patients as they are moved around the hospital.

“As a management tool, it is easily viewed by general managers and other senior staff, which helps them manage their departments performance.

“Now that the Klok system has been operational for some time at the Lister and QEII hospitals, the benefits are really starting to emerge. It’s reduced the incidence of breach, and despite some initial reservations from staff who felt that this was a management-only tool, and that they would prefer to continue using the whiteboard, staff very quickly realised that Klok made the old manual whiteboard a thing of the past. In fact, the staff who originally resisted the system now threaten death if it goes offline!”

“The features seen as most useful by our A&E staff is the ‘white’ display indicating the allocation of a doctor or clinician...”

Teri-ann Grange
I.T. Projects Manager
If you would like to see Klok in action, the East and North Hertfordshire NHS Trust is happy to show interested parties the live system. Alternatively, Blueberry also has a test system online, which can be accessed via a login that can be provided on request.

For further details, please contact John Davies, Senior Software Designer, for Blueberry Consultants Ltd:

john.d@bbconsult.co.uk
Tel: 0121 285 0100

Blueberry Consultants Ltd
Unit T1, The Arch
48-52 Floodgate Street
Birmingham B5 5SL
United Kingdom

Web: www.bbconsult.co.uk
Tel: +44 (0)121 285 0100
Fax: +44 (0)121 772 3103