A trust used information technology to make its Hospital at Night service safer and more efficient while improving staff satisfaction.

Using IT to improve out-of-hours care

In this article...

- Difficulties with an existing Hospital at Night service
- How new technology improved this service
- How health professionals responded to the new system

Keywords: Out-of-hours care/Hospital at night/Information technology

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5 key points

1. Hospital at night (HaN) services provide cover for roughly 75% of a hospital's working year and must adhere to the same clinical governance standards as core-time services.
2. HaN practices using bleeps sap staff morale and put patients at risk.
3. Hospitals can function safely out of hours with a small clinical team, but only with the aid of technology to support team processes.
4. Appropriately introduced IT can increase safety and reduce costs.
5. HaN coordinator roles can support ward staff and act as a hands-on nurse with supporting technology.

Like most UK hospitals Nottingham University Hospitals Trust (NUH) introduced the Hospital at Night (HaN) programme in 2006. This was in anticipation of the introduction of the European Working Time Directive, which reduced the number of hours each doctor could work from around 56 to 48 hours per week, and imposed a strict limit of 12 hours in a single shift. The result is that hospitals have far fewer doctors available out of hours than before and HaN services were implemented across the NHS (NHS National Workforce Projects, 2008).

The HaN service manages clinical activity from 5pm weekdays through to 9am, and all day on weekends and public holidays, accounting for approximately 25% of hospital time. While medical patients typically need the same care as they do during core hours and emergency admissions need to be managed, staffing levels are low out of hours. Four junior doctors, two clinical support workers and one registrar manage the clinical needs of the hospital's City campus, which consists of many separate buildings interconnected by long corridors. It takes 15 minutes to walk the kilometre from one end of the campus to the other.

The HaN team's workload consists of around 1,500 requests each week from ward staff, covering high (red), medium (amber) and low-priority (green) requests (Fig 1). These include an average of 15 emergency admissions and 10 specialist referrals every night. During the twilight shift an average of one request is raised every five minutes.

In line with many hospitals in the UK, the trust recruited 14 HaN coordinators — band 6 nurses — with one at the City campus and the trust's other site (Queen's Medical Centre) per shift. The coordinators support ward nurses by providing clinical advice and making it easier and quicker to contact the HaN doctors and clinical support workers. Before this initiative, ward nurses would call or bleep a coordinator when they needed clinical assistance. The coordinator would speak to the ward, provide advice where appropriate and, where necessary,
pass the request on to a doctor. This involved bleeping and waiting for the relevant doctor to call back in order to assign the task.

**Breaking point**

As the HaN coordinator role evolved it became clear that relaying messages between wards and doctors was almost a full-time task. Coordinators were tied to a control room armed with a bleep, a phone and a spreadsheet for recording requests, and had no time to see patients. Each time medical assistance was needed the coordinator would bleep a doctor, then had to leave that phone clear for the return call; this could take 10 minutes if the doctor was not near a phone or in the middle of a procedure. At busy times, coordinators would get 15 or more bleep requests at a time, creating problems:

- The bleep unit can only store the last 10 incoming numbers, so if the coordinator had not made a note of the number, it was lost – with no feedback to the requesting nurse this could lead to harm;
- All bleeps appear equal, so coordinators had no way of knowing which were urgent and could not prioritise how the calls were answered.

These problems were safety issues as they caused delay and, on rare occasions, even resulted in serious untoward incidents. The old HaN system also sapped staff morale. The coordinators did not have time to see patients or use their nursing skills. As a result it became more difficult to recruit and retain teams. Two internal trust reviews – one of the out-of-hours service and one of the HaN service, undertaken in 2009 and 2010 respectively – highlighted these problems.

**HaN reinvented**

In September 2010, we started working with NUH’s information and communications technology (ICT) services to identify how technology could help to solve the problem. The trust had just finished deploying a Cisco Medical Grade Network that coupled hospital-wide wireless connectivity with mobile devices including Cisco wireless phones, BlackBerry mobile devices and Cisco Cius tablets. This proved to be the foundation on which we could build a solution to our problem.

Also around this time Andrew Fearn, director of ICT services, had identified a software package that he believed could help to remove delays from hospital processes. Nervecentre provides a real-time workforce management system that operates closely with the Cisco Medical Grade Network. We discussed trialling this software for HaN; it seemed to be a perfect fit.

The system was quickly adopted – just a week after the trial started the HaN teams were comfortable using it. With this system the ward nurse enters a request for clinical assistance at any computer using a form customised to NUH requirements. The form is based on the NHS Institute for Innovation and Improvement’s Situation; Background; Assessment; Recommendation tool and ensures a consistent and accurate set of information is captured for every request.

Once submitted, Nervecentre sends the request to a coordinator on a Cisco Cius handheld tablet device. Coordinators can see at a glance all information entered by the ward nurse, including the priority, location and details of the request. When they select a job, a list of doctors on shift is shown, including where they are in the hospital and how busy they are. They select a doctor and information is sent directly to a mobile device held by that doctor.

Ward nurses still call or bleep coordinators for high-priority requests, which are then entered into Nervecentre. With only the highest priority requests coming through as bleeps, the volume of bleeps to coordinators has dropped from one every five minutes to less than one an hour; this means coordinators never have a backlog of bleeps and can respond to them rapidly.

**Benefits of the system**

The system has reduced the previous seven-step process to one of four steps (Fig 2). It has also had a number of positive effects, a few of which are highlighted below.

**Supporting junior doctors**

As the senior doctor on site, the registrar is ultimately responsible for all clinical decisions made on a shift. However, with doctors spread so thinly across large areas, with only the bleep to keep in touch, it was almost impossible for registrars to monitor and support junior doctors’ decisions. Doctors were responsible for contacting the registrar if they were unsure of a treatment, but using a bleep to contact a busy registrar was difficult and introduced such a delay, it was not always practical or possible.

The new HaN system copied all high-priority incidents to registrars when they were raised by the ward. This means registrars can decide to help a junior doctor if they think there could be complications, rather than relying on the doctor to make that call for help.
TABLE 1. EFFECT OF NEW SYSTEM ON COORDINATORS’ TIME

<table>
<thead>
<tr>
<th>Shift</th>
<th>Hours</th>
<th>Logging calls on phone (hrs:mins)</th>
<th>Giving clinical advice over phone (hrs:mins)</th>
<th>Logging calls on phone (hrs:mins)</th>
<th>Giving clinical advice over phone (hrs:mins)</th>
<th>Providing direct clinical care (hrs:mins)</th>
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<td>6:30</td>
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Information governance
The old HaN system relied heavily on paper records. Doctors needed to write down the information they were given by the coordinator on a handover and task list. In one situation, a relative of a patient saw information on a handover sheet that was left on a nurses’ station while a call was taken. The patient had not previously shared the full extent of their condition with relatives, and this caused a great deal of anger and upset within the family and subsequently led to a formal complaint. The new system removes that problem by removing the paper trail.

Safer handover
Doctors praise the system for making handover easier and safer. Written handover lists can be easy to misread and information can be misinterpreted, which is a real risk. With all information held on a central system and displayed on the doctor’s phone, it is accessible immediately by the new doctor at handover, who gets accurate information on the patient’s condition. The information is also safe should the doctor’s handheld device be lost, it can be disabled remotely.

Efficiency
To assess the efficiency impact of the new system we compared workflow in a typical week before it was installed with one after it was fully operational. Data collected in the week beginning 14 March 2010, before Nervecentre was introduced, showed the HaN coordinators received on average 160 calls each shift. To deal with these they had to phone the ward, log the call on the computerised spreadsheet, page a doctor or clinical support worker and wait for them to respond. As a result, only rarely could they leave the HaN coordinator’s office.

Data collected in the week beginning 13 March 2011 showed that, while there was still a similar number of calls, the HaN coordinators allocated 93% of them while out of the office. As a result they are able to spend around 60% of their shift providing direct clinical care on the wards, putting some 8,000 hours a year back into direct service delivery (Table 1).

Satisfied staff
As senior nurses, the coordinators had found it frustrating to be tied to a control room performing what was, essentially, an administrative function. They can now be anywhere in the hospital and still provide an immediate response. The only jobs coming through on the phone or bleep are high priority, so coordinators can get out onto the wards; this boosted staff morale.

It is not only the coordinators who have seen an improvement in their jobs. Ward nurses like the reduction in delays and the simplicity of raising a request, compared with bleeping coordinators then waiting by a phone for the call back.

Once the system rollout was complete, we ran a staff satisfaction survey based on the IBM Computer System Usability Questionnaire (Lewis, 1995). We received 20 responses from an even distribution of doctors, ward nurses and coordinators and the results were encouraging. The new system scored an average satisfaction score of over nine out of ten across all questions. In those related to the safety of the new service, the survey showed an improvement from around five or six to nine out of ten.

Future plans
The project has been a success at City Hospital, and we are in the process of rolling out the system to the Queen’s Medical Centre campus.

We now have a greater ability to audit the care we provide using Nervecentre. Within minutes we can pull up the actions taken, response times, decisions made and workload of the staff involved for any incident on any day over the last six months. According to a study by the Association of Chartered Certified Accountants (2011), which looked at cash-releasing and cost-avoidance benefits, we have even found the solution paid for itself within four months; the cost of running the HaN service has decreased due to having the coordinators back on wards, while length of stay has reduced due to improved patient care.

There are many areas of the hospital where this technology could make similar improvements. We are working with Nervecentre and Cisco to roll it into other hospital processes and expect to have improved several by the end of the year. Reducing delay and cutting the administrative duties of nurses is always welcome, so departments are keen to work with us.

The performance improvements reported in this article were measured by the Association of Chartered Certified Accountants, an independent third party, which has released a detailed report on performance improvement and how it impacts on staff, patients and finances. For details go to tinyurl.com/ACCA-HaN

References


16 Nursing Times 08.11.11 / Vol 107 No 44 / www.nursingtimes.net