

A team approach to reducing *Clostridium difficile* and MRSA bacteraemias

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Abstract

The infection control and prevention team at East Kent Hospitals NHS Trust decreased the number of healthcare-associated infections considerably following the introduction of a range of methods and interventions. The hospital saw a 49% reduction in cases, with no cases of bacteraemias found in January 2008. *Clostridium difficile* rates per 1,000 bed days between April 2007 and January 2008 were 0.82 per 1,000 bed days – one of the lowest rates in the NHS. The introduction of root cause analysis in 2007 for all *C. difficile* cases assisted in the decline in infection numbers.

Introduction

East Kent Hospitals NHS Trust (EKHT) is the sixth largest acute hospital in the country and is spread over a large geographical area with 40 miles between the two main hospital sites; the William Harvey Hospital (WHH) in Ashford and the Queen Elizabeth the Queen Mother Hospital (QEQMH) in Margate. The Trust has approximately 1300 in-patient beds divided between the three main sites; specialties are concentrated at Kent and Canterbury Hospital (KCH), and include urology, vascular medicine, oncology/haematology and the main renal unit. Renal satellite units are based at the QEQMH and WHH, and the team also covers the satellite unit at Maidstone Hospitals NHS Trust. Buckland Hospital Dover (BHD) and the Royal Victoria Hospital Folkstone (RVHF) provide outpatient services, including a renal satellite unit, a nurse-led birthing centre and a paediatric ambulatory care ward at BHD, and a urology suite at RVHF.

The team

Two senior infection control nurses provide a 24/7 infection control on-call service, working on a one in two weekend rota. The three consultant microbiologists provide 24/7 cover on a rota basis, which is shared with a part-time consultant microbiologist affiliated with the University of Canterbury. The microbiology laboratories are based at Margate and Ashford, with Ashford providing regional services for Kent.

In the last four years the hospital has been undergoing an extensive reconfiguration programme: the QEQMH has a new heart centre and oncology day care unit; the WHH has a new neonatal intensive care unit and renal satellite unit; and KCH has a new endoscopy unit, day surgery unit and renal unit. In addition, various wards at the three main sites have undergone redecoration and extensive refurbishment. Building will soon commence at the QEQMH and WHH with the addition of two negative pressure isolation rooms on each site.

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Challenges

The size of the team, part time clerical support and the geographical split represent challenges for the infection control and prevention team (IP&CT). The team is under-resourced and cross-site working, site cover and attendance at meetings is required as part of the team's day-to-day work. The workload is very large and additional hours in excess of contracted hours are the norm.

Refurbishment

Extensive building work and re-configuration of services has lead to challenges around patient placement and hospital cleanliness. The extensive IP&CT involvement with the reconfiguration has made extra demands on an already over-stretched service. At the same time, this has increased the profile of the team within the facilities and strategic development directorates.

Number of Isolation rooms

Although the WHH has a 15-bedded isolation ward (single rooms), there is an insufficient number of isolation rooms across the three sites as a whole, particularly at KCH, and the use of or allocation of single rooms has to be continually risk-assessed. The hospital does not currently have a "live" bed management system, although this is being explored.

Public image

Significant community outbreaks of Norovirus since November 2006 have resulted in a number of ward closures at the three sites which have resulted in considerable local media interest (live television and radio interviews and newspaper interviews). Reduced bed numbers and staffing levels within the hospital, coupled with the seasonal "winter pressures" have stretched resources almost to the limit and put increased pressure on the IP&CT. In spite of this, major hospital-wide outbreaks have been prevented and the provision of patient services has continued.

Healthcare associated infections

Reducing Methicillin Resistant *Staphylococcus aureus* (MRSA) bloodstream infections and *C. difficile*.

Methods

Communication

The IC&PT meet up monthly. Quarterly infection control committee meetings also take place with infection control directorate leads. Information is disseminated via the hospital's magazine and the intranet, while PC screen savers carry infection control messages. Patients and visitors are informed through leaflets. The infection control and prevention team maintains strong communication links with patient and public involvement forums and also the media.



The team with the award for second place of 2007/08

Improving clinical practice

In the last three years, the hospital has introduced several methods and interventions to control infection. This includes:

- Silver-coated urinary catheters and central venous catheters (CVC5).
- Biopatch chlorhexidine impregnated dressings for all renal patients with vascular access devices.
- Two per cent chlorhexidine in 70% alcohol for skin decontamination prior to blood culture collection.
- Dedicated Vygon Biovalve Peripheral Cannula Insertion packs for the insertion of all peripheral cannulae as part of mandatory guidelines.
- The introduction of a new tool to record the insertion and management/ongoing care of the cannula was introduced.
- Development and dissemination of "10 important points" as part of a "10 Point Plan" for the use and management of peripheral IV cannulae, CVCs, urinary catheters, blood culture collection, Norovirus, *C. difficile*, alcohol hand rub and the safe use and disposal of sharps.
- Alcohol hand rubs on bedside lockers and the foot of the bed to promote hand hygiene as part of the National Patient Safety Agency's cleanyourhand campaign.
- Root cause analysis (RCA) for all MRSA bacteraemias

The hospital recently published best practice/evidence-based Vascular Access Management Guidelines covering the management of all vascular access devices used within the hospital.

The hospital has developed an Operational Policy for the Risk Management of MRSA for all Patients Admitted to EKHT and introduced MRSA admission screening for all emergency admission via the clinical decision units. In this case, the only patient groups not admission screened within the hospital are day surgery cases, for example, paediatric and maternity patients. The team also introduced the pre-emptive decolonisation of high risk patients for MRSA acquisition. This included patients that were previously non-positive and admissions from nursing and residential homes.

Audit

Audits of compliance are undertaken as part of the hospital's MRSA admission screening policy. Weekly audits are carried for hand hygiene compliance by the wards. Results are fed back to the infection control focus groups and to the IP&CT at the directorate lead meetings.

There are ongoing IC environmental audits for all wards/departments every 12-18 months in conjunction with the IC link worker. The ward/department manager is expected to devise and implement an action plan within a specified time frame.

Annual "commode" and "sharps" audits are performed by respective companies. Another annual audit is for peripheral cannulae/central venous catheters and urinary catheters by IC link workers with the clinical audit and effectiveness department.

Education

- The hospital implements mandatory infection control training for senior nurses. This includes MRSA and *C. difficile*, isolation practices, standard precautions, hand hygiene and the management of invasive indwelling devices.
- Medical staff are given IC training on induction and there are additional education sessions for Foundation year 1 doctors. Hospital "grand rounds" on antibiotic prescribing and the prevention and management of *C. difficile* are also conducted.
- IC E-Learning package, based on evidence-based infection control (EPIC2) guidelines, has been enforced and is being shared with other hospitals.
- Annual IC training for Medirest staff and mandatory annual hand hygiene assessment. IC link workers have been identified with Medirest and trained in hand hygiene assessment techniques.
- IC study days are held for healthcare assistants.
- Education sessions at all IC link worker meetings and link worker conferences are held every 12 to 18 months with national speakers.

Infection rates

The Department of Health target has presented a significant challenge for the hospital. Between 2001 and 2004, the hospital had already demonstrated

a 30% reduction in MRSA bloodstream infections, wherein EKHT had the third lowest rate of bacteraemias in the country for specialised hospitals in 2004. But the target has meant the hospital has had to reduce the number of bacteraemias from 70 to 28.

In order to respond to the MRSA bacteraemia target and raise the profile of infection prevention at the hospital, directorate infection control leads have been identified. Monthly directorate leads meetings are held. These are led by the IP&CT, who provide support and leadership along with a framework for performance management. Each Directorate has been issued with key performance targets to be met, and at each meeting the leads are required to report on weekly hand hygiene compliance audits; weekly MRSA Admission Screening compliance audits; feedback from individual directorate focus groups and compliance with infection control mandatory training.

Results

MRSA

Between January 2004 and December 2007, the hospital saw a 49% reduction in cases, and there were no bacteraemias in January 2008 (EKHT rate 0.66 per 10,000 bed days, NI-IS average = 1.59).

The target is still to be met, with 25 bacteraemias to date. But there has been a significant reduction in cases.

C. difficile

C. difficile numbers have fallen by 58% between January and December 2007. The *C. difficile* rate per 1,000 bed days between April 2007 and January 2008 is 0.82 per 1,000 bed days – one of the lowest rates in the NHS. Some of the main reasons for this reduction

are the use of revised/restricted antibiotic prescribing; targeted education; enhanced cleaning in high-risk wards; rapid isolation of patients with diarrhoea; and initiation of treatment in suspected cases. The introduction of root cause analysis in 2007 for all *C. difficile* cases also assisted in the fall in infection numbers.

Through the establishment of the Directorate Leads and Directorate Focus Groups, the IP&CT have succeeded in making a significant shift towards moving the responsibility for the prevention and control of healthcare associated infection and the achievement of government targets out into the ward/departments.

Conclusions

Data from the Department of Health indicates that the reduction in HCAI within EKHT since 2003/2004 has saved £9m and over 19,000 bed days.

The methods employed by the team, while not particularly novel, have been effective as evidenced by the hospital's MRSA and *C. difficile* rates. In spite of the team's size and the resources, the profile of infection prevention and control within the hospital has increased over the last 18 months.

Real results have been seen within the renal directorate. In October 2006, the renal focus group won an award for "Best Team" at the Annual Trust Awards Ceremony.

In 2006 the IP&CT won the Highly Commended Certificate for Team Achievement and Contribution at Work (annual EKHT Awards Ceremony). In February 2008 one of the infection control nurses had an infection control nursing text book published by a leading medical publisher.